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Study in the Epidemiology of Diphtheria in Relation to the Active Immunization of Certain Age Groups*†

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IT has long been known that it is not necessary to destroy every Anopheline in a region to rid it of malaria; that the vaccination of much less than 100 per cent of a population is quite effective in preventing the spread of smallpox; that epidemics of measles cease long before the susceptibles are exhausted. But since it is commonly believed that diphtheria is usually spread by healthy carriers, grave doubt exists whether anything less than the immunization of the entire child population will suffice to reduce this disease to negligible proportions. However, several experiences in New York State during the past 9 years have seemed to indicate that if certain minor fractions of the population be immunized an epidemic of diphtheria will not occur or if present, will promptly subside after these fractions have been immunized. The determination of this question therefore is of great practical importance.

It can be taken as reasonably well proved that a considerable majority (65–95 per cent) of those given 3 injections of either toxoid or toxin-antitoxin thereby become immune to the disease. If this be all that happens then diphtheria will only be reduced among those treated and only to the extent that those treated actually become immune. On this assumption if half the children age 0–14 years are given 3 doses

* Read before the Health Officers Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

† This is a part of a study to determine the effectiveness of procedures for the reduction of diphtheria, assisted by a grant from the Commonwealth Fund and under the auspices of the American Public Health Association through its Committee on Administrative Practice.

TABLE I

DIPHTHERIA DEATH RATES PER 100,000 POPULATION, AND PER CENT OF POPULATION IMMUNIZED* BY AGE: NEW YORK STATE, EXCLUSIVE OF NEW YORK CITY AND ROCHESTER, 1920–1930

Year	Deaths per 100,000 population at age:				Per cent of population immunized at age:			
	All ages	Under 5 years	5–9 years	10–14 years	All ages	Under 5 years	5–9 years	10–14 years
1920	17.2	103.2	55.5	15.9				
1921	16.1	87.5	58.4	17.1				
1922	11.3	62.2	43.9	11.1	0.2	*	1.2	1.2
1923	8.8	56.6	27.2	6.7	0.8	0.4	4.0	3.3
1924	7.3	46.6	20.7	6.4	1.4	1.7	7.2	5.0
1925	5.8	33.4	19.4	6.2	1.9	1.5	10.3	6.8
1926	4.4	24.8	15.8	5.2	4.0	5.2	21.8	14.3
1927	4.7	29.7	17.1	3.6	8.0	12.3	41.1	28.9
1928	4.0	24.9	13.4	3.5	10.3	16.1	47.7	40.9
1929	3.6	22.3	13.3	3.2	12.8	21.1	55.2	51.0
1930	2.6	16.5	7.7	1.7	15.0	25.3	60.6	60.1

* As of Dec. 31 of year stated.

of antigen and three-fourths of them become Schick negative only three-eighths of this age group would be protected. As three-fourths of the cases occur during this age period the diphtheria case rate should be reduced only by 9/32, or approximately 28 per cent. On the same assumption, if only half as many children under 5 years be immunized

TABLE II

DIPHTHERIA DEATH RATES PER 100,000 POPULATION, AND PER CENT OF POPULATION IMMUNIZED* UNDER 15 YEARS OF AGE: PLACES OVER 10,000 AND UNDER 10,000 POPULATION IN NEW YORK STATE, EXCLUSIVE OF NEW YORK CITY AND ROCHESTER, 1920–1930

Year	Deaths per 100,000 population in places:		Per cent of population immunized under 15 years of age in places:	
	Over 10,000	Under 10,000	Over 10,000	Under 10,000
1920	25.8	8.6		
1921	22.6	9.5		
1922	14.6	8.1	1.3	0.3
1923	11.4	6.2	4.1	1.1
1924	9.7	4.8	7.1	2.3
1925	7.1	4.5	9.1	3.5
1926	5.9	2.9	17.1	11.0
1927	5.8	3.7	31.7	24.2
1928	5.3	2.7	41.1	30.1
1929	4.7	2.5	50.5	36.2
1930	3.3	1.9	58.9	40.7

* As of Dec. 31 of year stated.

as children 5–9, the effect should be to reduce the incidence in the latter group twice as much as in the former.

As a matter of fact neither of these things seems to happen. Although in New York State more than twice as many children age 5–9 have been given toxin-antitoxin than age 0–4 the specific age death rates have declined with remarkable parallelism (Table I). Furthermore, this parallelism is equally striking in the rates for places over and places under 10,000 population despite a preponderance of immunizations in the former (Table II). These observations may be interpreted either as indicating that the recent decline in diphtheria is independent of active immunization, or at most only assisted by it—or that the protection of a certain part of the community affords a general protection and that a protected urban center serves to reduce the incidence in adjacent territory.

Efforts to prove a causal relationship between active immunization and declining annual diphtheria death rates by merely measuring deviations from a trend are quite unconvincing to one acquainted with

FIGURE I

CASE AND DEATH RATES PER 100,000 POPULATION: AUBURN, 1913-1930

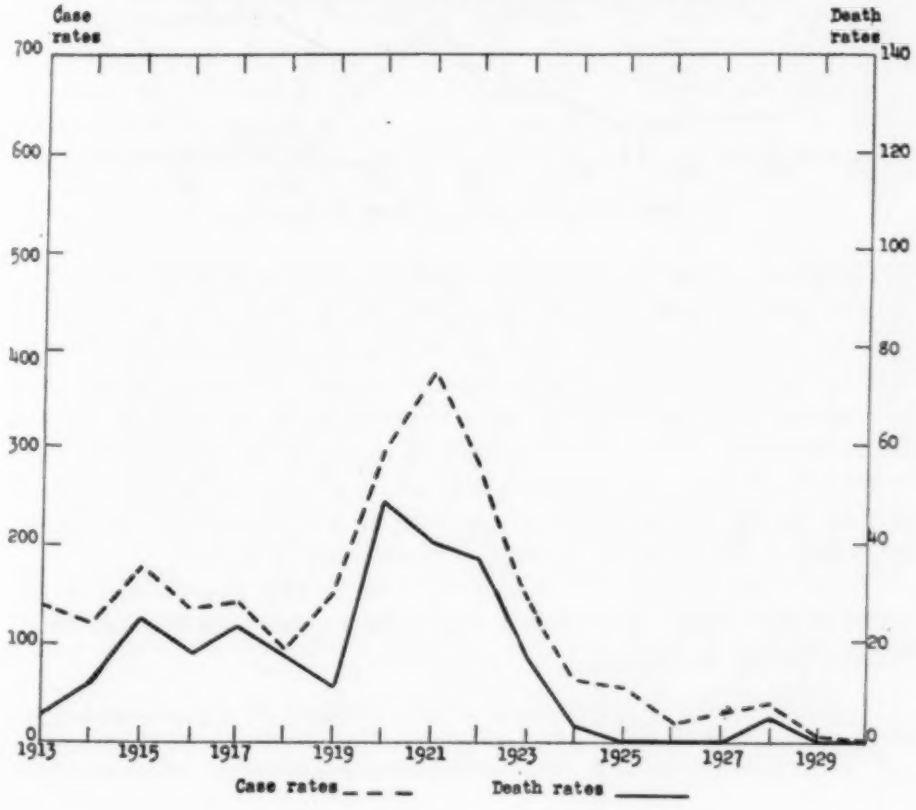
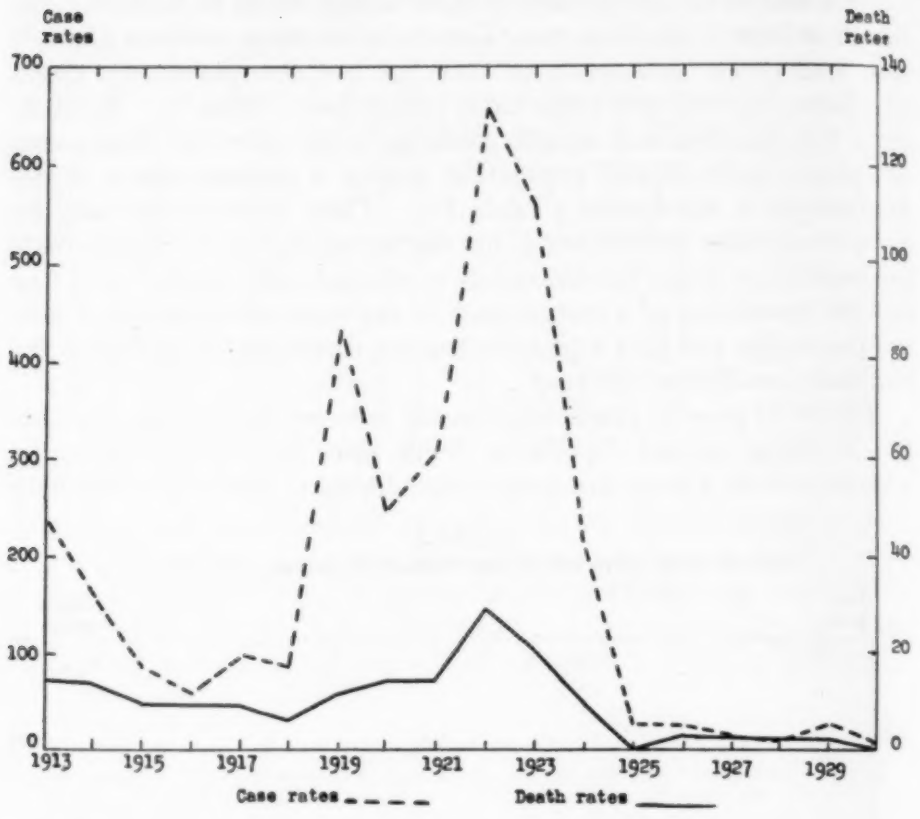


FIGURE II

CASE AND DEATH RATES PER 100,000 POPULATION: AMSTERDAM, 1913-1930



the behavior of these rates when unaffected by factitious influences. On the basis of their annual diphtheria death rates it is quite impossible to determine whether Auburn (Figure I), or Amsterdam (Figure II) was the scene of the first community-wide toxin-antitoxin drive, yet several thousand children were immunized in the former city and only 300 in the latter. Furthermore, if the declines in the death rates in New York City and Philadelphia can be attributed to large but indefinite numbers of immunizations, how do we account for the failure to produce a like effect in Newark, Detroit, and Buffalo?

It is believed that the answer may lie in two generalizations induced from certain observations made during the past 9 years which may be stated as follows:

1. The attainment of a high degree of herd immunity among children 5–9 and 10–14, as evidenced by the injection of 3 doses of toxin-antitoxin in 50 per cent or more of the members of these groups, produces no definite effect on the diphtheria

incidence in that community. Diphtheria if prevalent continues prevalent for a considerable period and declines gradually as it does when active immunization is not used. If not prevalent an outbreak of considerable proportions may arise.

2. However, when the immunization of approximately 30 per cent or more of the children under 5 years is superimposed, there is an immediate definite decline in the current prevalence, and if the community be free from the disease or if its prevalence be low an outbreak is very unlikely to occur.

In other words, there is a critical point in the under 5 age group which must be attained and sustained in order to affect the diphtheria rate favorably.

Whether the immunization of 30 per cent or more of the under 5 age group would be effective without any immunizations among older children cannot be determined. There is no evidence on this point and it seems unlikely that any community will so strictly limit immunizations to children under 5 years as to provide that evidence.

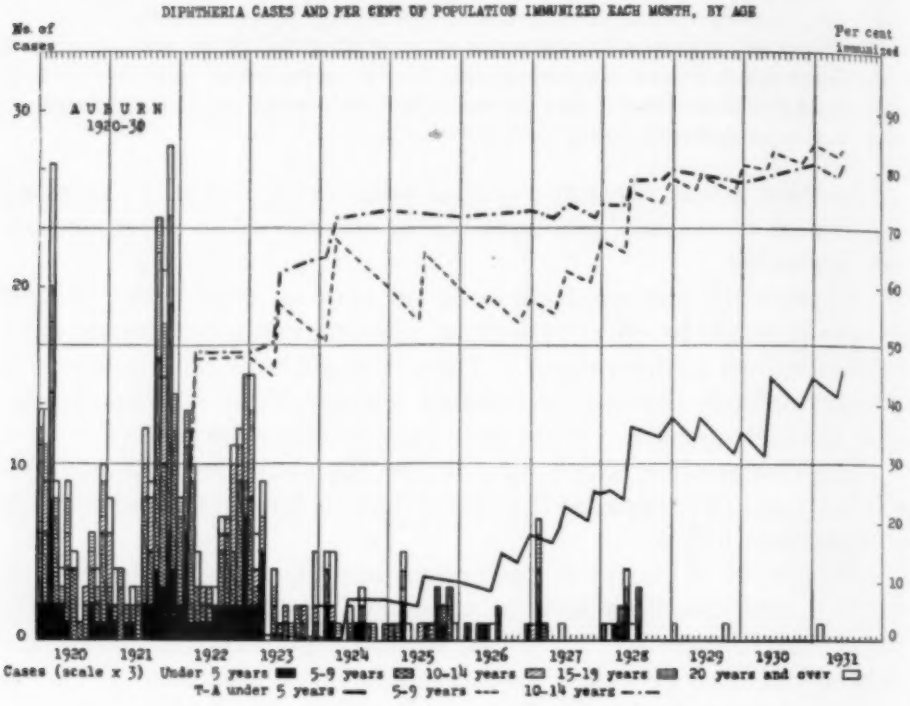
The observations which have led to the above hypothesis and a brief attempt to rationalize it with our knowledge of the epidemiology of diphtheria follow:

Auburn, N. Y., as everyone knows, was the scene of the first attempt to eradicate diphtheria on a community-wide basis through the use of toxin-antitoxin. As will be seen in Figure III (see note), the disease had been prevalent for 3 years when in February, 1922, the campaign was started by Dr. Sears. It will be noted that during this early period (1) nearly 50 per cent of the children age 5–9 and 10–14 were either found Schick negative or given 3 doses of toxin-antitoxin; (2) the 0–4 age was neglected; (3) there was a recrudescence of the outbreak in the fall and winter of 1922–1923; (4) in this city of 30,000 although never attaining the proportions of an outbreak diphtheria continued present almost every month for over 3 years and was not effectively curbed until after July, 1928; (5) in May, 1928, the cumulative percentage of children under 5 years first reached 30 per cent of those in this group; (6) the proportion of children 5–9 and 10–14 increased to 60 per cent and 70 per cent respectively without marked effect on the residual diphtheria.

The recrudescence in the fall of 1922 was attributed at the time to the belief that it required 6–9 months to produce immunity with the toxin-antitoxin then in use. It is now believed that it was due to the

NOTE: The declination in the lines showing the percentages of children immunized is based on the assumption that one-twelfth of the children age 4 will graduate each month into the age group 5–9. Hence, if the immunizations in the group over a period of time are fewer than the graduations from it, the percentage of immunized children in that group will fall accordingly. Similarly the children in the 5–9 age group are assumed to graduate at a uniform rate into the group 10 years and over. The losses in this group, however, may be more or less counterbalanced by graduations from the age group below it.

FIGURE III



fact that children in the under 5 age group were not reached and that the subsequent decline in diphtheria could in large part be attributed to the usual recession from a period of high prevalence.

Nearly 5 years later, in the fall of 1926, Newburgh, N. Y., population 30,000, carried out a campaign of immunization during an epidemic that had lasted about 18 months (Figure IV). Normally we should have expected it to last through the succeeding winter probably attaining its maximum for the epidemic year in December or January. Observe that approximately 35 per cent of the 0–4 and 65 per cent of the 5–9 age groups were treated during a period of about 6 weeks. Note also the almost complete disappearance of diphtheria immediately following and its continued absence.

In the spring of 1927 a similar campaign was carried out in Utica, N. Y., population 100,000 (Figure V). The administration of toxin-antitoxin during 1926 to 7,000 school children, comprising 40 per cent of the 5–9 age group, 30 per cent of the 10–14 group and only 2 per cent or 3 per cent of the under 5 group, had had no effect on the mass incidence the following winter. The 1927 campaign raised the 5–9 group to 60 per cent, the under 5 group to nearly 40 per cent and the

FIGURE IV

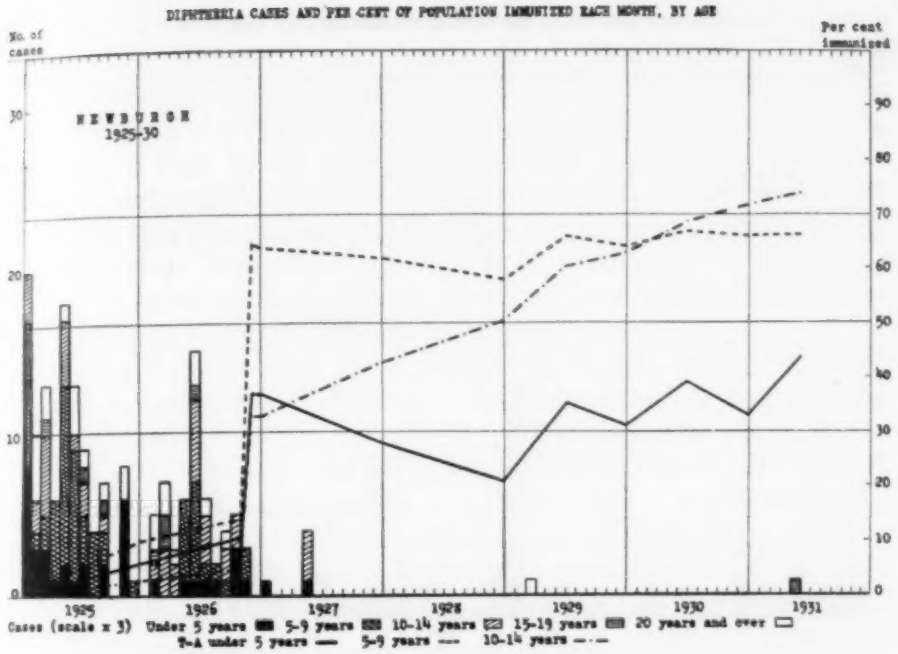


FIGURE V

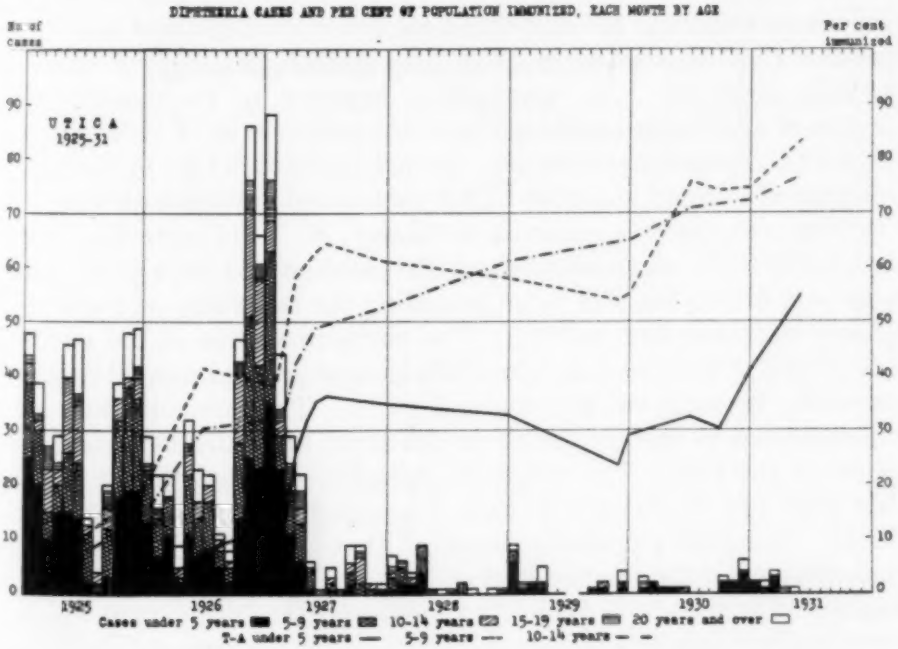
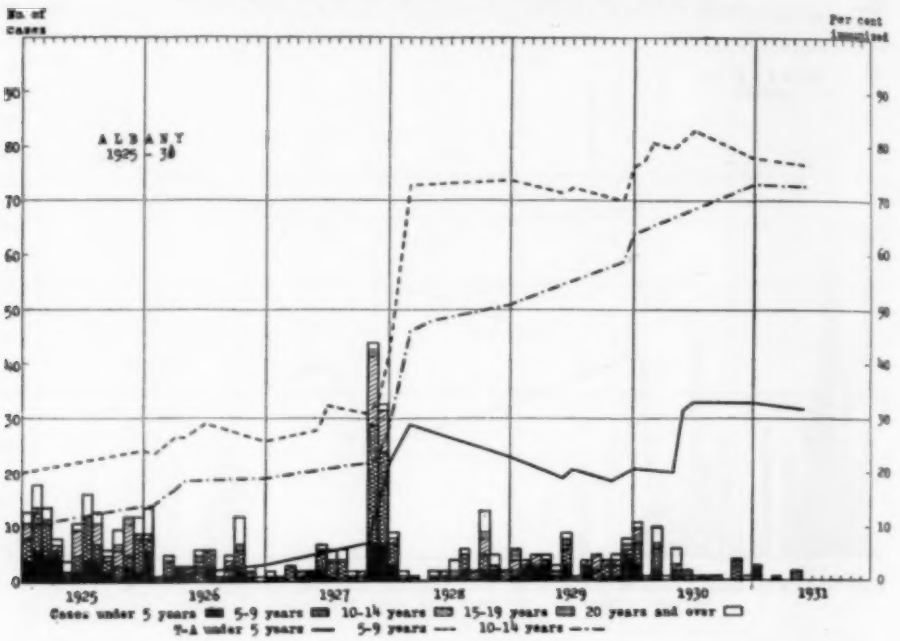


FIGURE VI

DIPHTHERIA CASES AND PER CENT OF POPULATION IMMUNIZED, EACH MONTH BY AGE



decline was immediate and rapid. The percentages have been quite well maintained and the diphtheria incidence has remained low. It is possible that the decline in Utica may have been simply a recession from an epidemic. An examination, however, of the monthly incidences of diphtheria unaffected by toxin-antitoxin in 22 cities of more than 25,000 population covering a period of 23 years fails to disclose an instance of as rapid a decline with a subsequent incidence so low.

The next example occurred in Albany, N. Y. (Figure VI), population 120,000. Approximately 5,000 children had been given toxin-antitoxin during the 2–3 years preceding the beginning of a quite explosive outbreak late in 1927. The northern section of the city was the principal focus and an immediate campaign was initiated designed primarily to reach children under 5 years. The immunizations were concentrated at first on the affected district but extended later to all parts of the city. The outbreak promptly subsided though a little less than 30 per cent of the under 5 age group were given toxin-antitoxin. It is highly probable, however, that a much higher percentage was attained in the affected district. Due to graduations, the percentage of children under 5 diminished to 20 per cent during 1929 where it remained until 1930 when another drive placed the figure above 30 per cent. The reduced endemic incidence since then is apparent.

This outbreak is among those deserving further study. No evidence that it was milk-borne was adduced and the age distribution is against this hypothesis.[1] On the other hand, the question arises as to what percentage of children in the different age groups living in the affected area were given toxin-antitoxin. Unquestionably it was much higher there than in the city at large. The continued presence of rather numerous cases until the latter part of 1930 shows that the city as a whole was not well protected. The geographical distribution of those later cases is another point yet to be investigated. Have they occurred in those parts of the city that have been relatively neglected or has the area of intensive work had its full share?

Niagara Falls (Figure VII), population 75,000, had given toxin-antitoxin to over 6,000 children and reached approximately 60 per cent of the children 5–9 by the end of 1927. Diphtheria had been prevalent the preceding winter and spring, continued at a lower rate through the summer and increased sharply in January, 1928. A well conducted drive by the city health officer resulted in raising the 5–9 age group to over 70 per cent and the under 5 age group from less than 10 per cent to over 40 per cent in the course of a few weeks. Note the marked drop immediately following and the comparative absence of cases until this past winter. This increase seems to be an exception to the rule and will be discussed further.

FIGURE VII

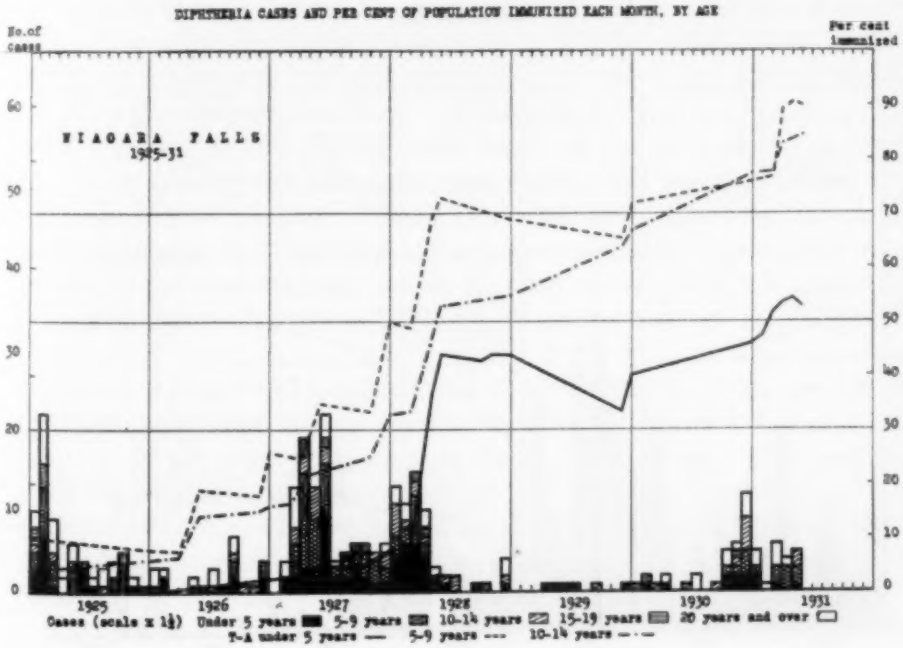
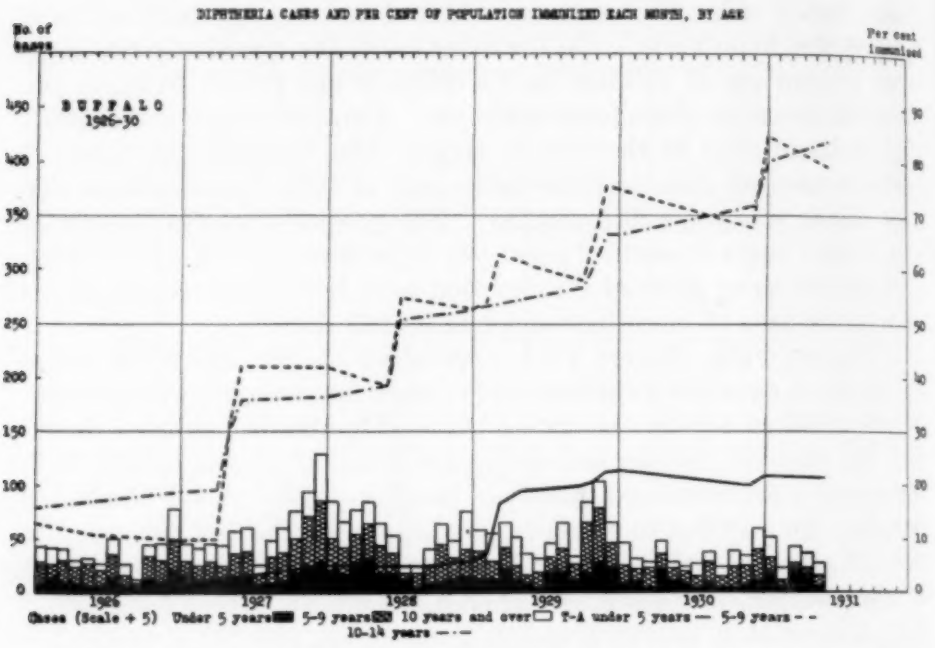
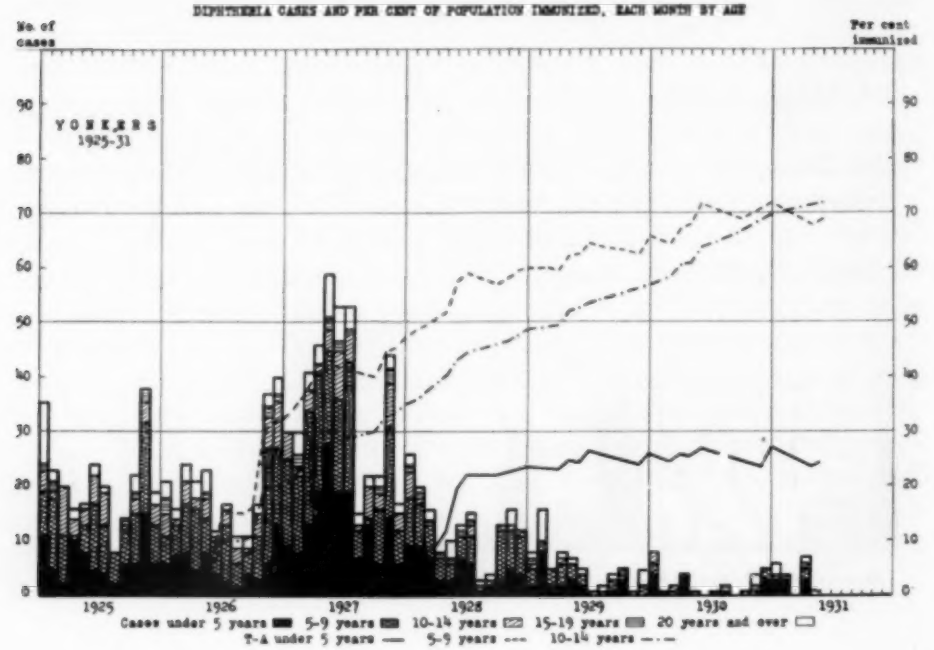


FIGURE VIII



Figures VIII and IX are to illustrate the failure to produce a marked effect on the community incidence of diphtheria through giving toxin-antitoxin to 50 per cent or more of children age 5–9.

FIGURE IX



If one be satisfied with mere numbers, Buffalo's effort should be most gratifying. Three doses of toxin-antitoxin were given to 28,800 children in that city in 1927, to 17,700 in 1928, 31,000 in 1929, 16,000 in 1930. During the 6 years ending December, 1930, it had been given to 95,935 individuals, an impressive number, though not an extraordinary percentage of the population. The age distribution of those given toxin-antitoxin and the failure of this work to produce any marked effect on the diphtheria incidence are shown in Figure VIII. More than 50 per cent of the age group 5–9 has been protected since the middle of 1929, and the attainment of even 70 per cent in this group plus over 20 per cent in the under 5 year group, has not sufficed to reduce materially the diphtheria incidence.

In Yonkers, population 130,000 (Figure IX), the period of high prevalence began in 1923, attained its maximum in 1927, and declined slowly through 1928 and the first half of 1929 when it became stabilized. Giving toxin-antitoxin to 50 per cent of the 5–9 age group and even 70 per cent of this group plus 25 per cent of the under 5 group produced no striking effect on the diphtheria incidence; except that stabilization is at a much lower figure than any ever previously attained by this city, the decline might well be due to "natural causes."

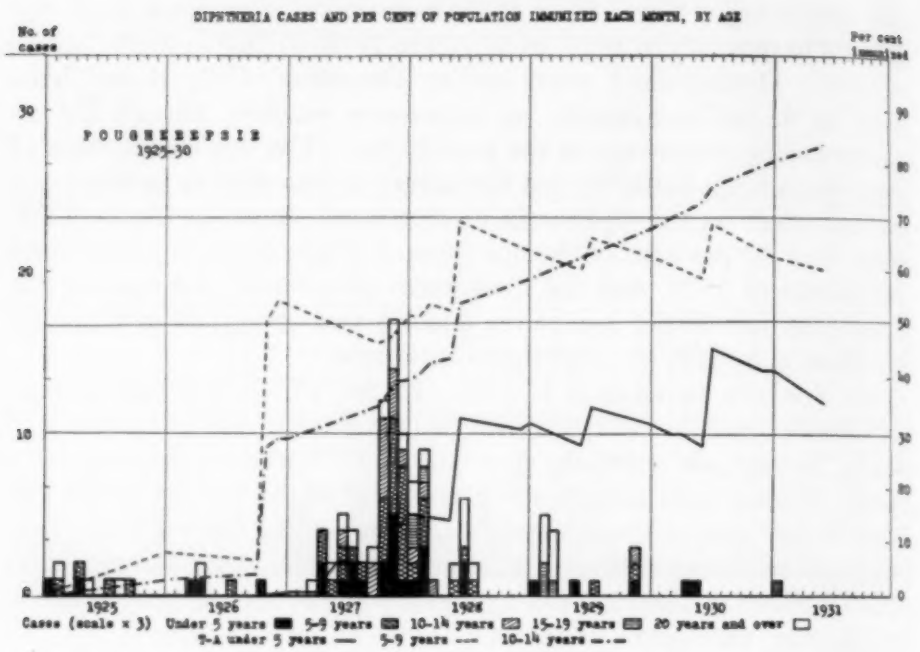
Failure to prevent a sharp increase in cases though 50 per cent of the 5–9 age group have been treated is illustrated by the following examples:

Poughkeepsie (Figure X), population 40,000, experienced an increase of cases beginning in the spring of 1927 and culminating the following fall and winter although about 50 per cent of the 5–9 age group had been given toxin-antitoxin. Following a drive in the late spring of 1928 during which slightly more than 30 per cent of the under 5 year group were given toxin-antitoxin there were no cases during the last 5 months of the year. The occurrence of 15 cases the following year despite the fact that the 5–9 age group was held at from 60 per cent to 70 per cent and the under 5 group never got much below 30 per cent suggests that these percentages afford little or no margin of safety.

Cohoes (Figure XI), population 23,000, after a 3-year period of high prevalence, had a well marked increase in the late fall of 1929 despite a 50 per cent protection of the 5–9 age group. The gradual rather than sudden subsidence may be noted. The occurrence of but 2 cases during the 11 months ending June 1, despite failure to immunize 30 per cent of the under 5 age group, is not unusual in places of this size.

Exceptions—A search of our records for the past 5 years has dis-

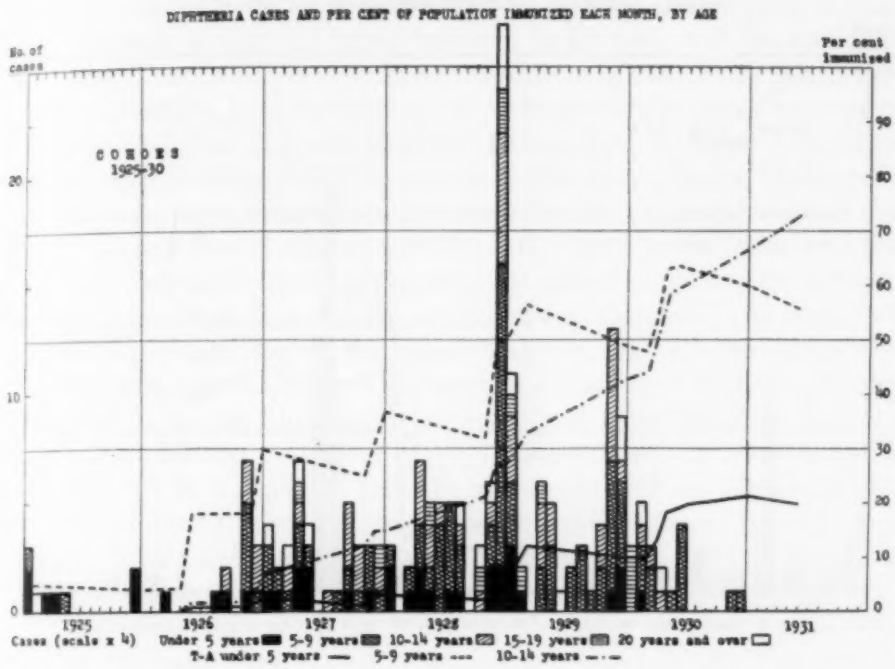
FIGURE X



closed 2 instances of sharp increases in the diphtheria incidence in places having 30 per cent or more of the under 5 age group protected. One of these, that in Niagara Falls (Figure VII), has already been alluded to, the other was in the village of Port Chester, population 20,000, in the late spring and early summer of 1929 (Figure XII). They are both being studied further, neither study being as yet complete. However, as together they indicate something of the method of approach, the material is presented for information and discussion.

In Niagara Falls the geographical relations of the cases to the births occurring during 1930 have been studied; the births being taken as an index of the distribution of the child population. The area of prevalence in the recent outbreak has also been compared with the preceding one in 1927–1928. The two have been found to overlap only in the central southern part of the city. In relation to the birth map the earlier outbreak was found to conform more closely to the child population distribution than the recent one although one densely populated area was but little affected in either outbreak. It is proposed next to study the geographical distribution of the children who have had toxin-antitoxin both in relation to the births and to the cases of diphtheria. Whether an approximate numerical relationship can be obtained is of course to be determined.

FIGURE XI

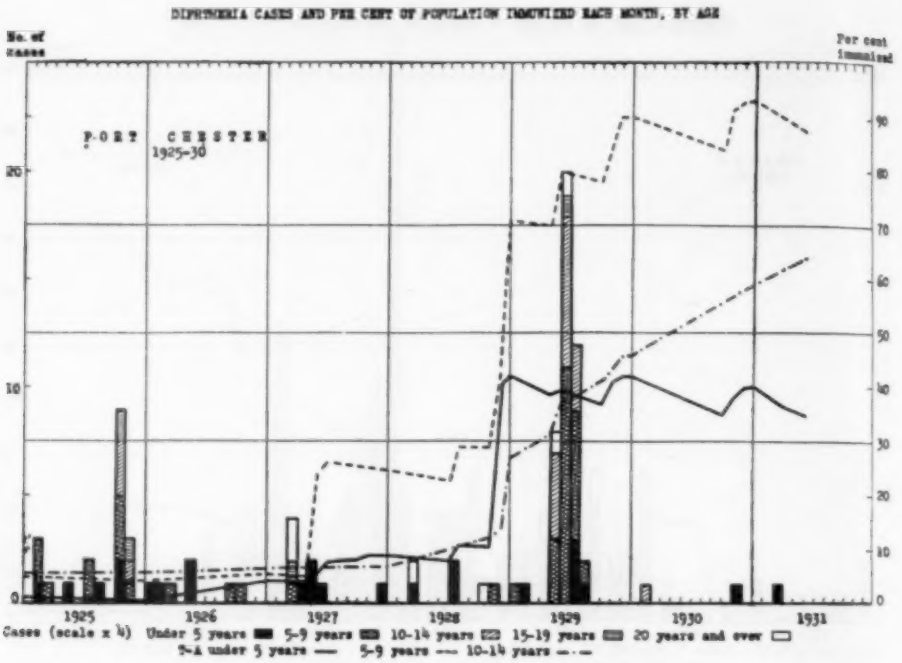


In Port Chester the geographical relationship of the cases to the children given toxin-antitoxin has been studied through a spot map showing the location of cases and immunized children. This map was kindly prepared for me by Dr. W. A. Holla of the Westchester County Health Department from the village records. The next step will be to relate cases and immunizations to the distribution of the child population.

The outbreak itself deserves a brief description since it represents much more complete case reporting than is found in the ordinary run of outbreaks. Furthermore it is not an exaggeration due to the inclusion of carriers. Every case included, I am informed, either had definite clinical symptoms of diphtheria when seen by a physician or gave a clear history of an attack that could not well be interpreted otherwise. The completeness of reporting was due to the activity of the village nurse who ferreted out the cases both among the known contacts and the children of the neighborhood. It is worthy of mention that all of these cases could be attributed to contact with a prior case, missed or recognized, but in any event an individual with a pathological condition that could have been due to the diphtheria bacillus.

We were informed upon inquiry that the section of the village in

FIGURE XII



which this outbreak occurred had not responded as well as other sections in having the children given toxin-antitoxin. This contention is not borne out by Dr. Holla's map. Obviously, however, the density of the child population in this area is a factor and no distinction is made on the map of immunized children over and under 5 years old. These are points for further investigation.

Of exceptions outside New York State the only one I have been able to discover is Detroit. Vaughan and Buck[2] have recently described the work in that city and I have since received further data from Dr. Gudakunst of the Detroit Health Department. The figures published in Vaughan and Buck's article indicate that only 21 per cent of the under 5 age group had been "immunized." It is important to note that the age group for which they give a "protection percentage" of 29.12 includes children up to 6 years. In New York we have adhered to the standard age groupings both because of convenience in comparing with morbidity, mortality, and population, and because age, rather than school attendance, is the important factor in determining mortality and preventing morbidity.

On the 21 per cent basis Detroit does not constitute an exception. However, during the first quarter of 1931 a canvass of some 91,000 children under 5 indicates that 58.3 per cent had been treated, a large

portion of them presumably during recent months. The effect on the morbidity rate has not been particularly striking. The unique system for diphtheria prevention being followed in Detroit, and the fact that the figure mentioned represents the results of a canvass requires further investigation to determine to what degree their records compare with ours. It would appear from comparing the reports on toxin-antitoxin in cities in New York State made to the White House Conference with those we have compiled in the State Health Department from the reports of local health officers that the latter tend to minimize and the canvass or census tends to exaggerate the actual degree of protection. Out of 9 cities in only 3 was the agreement as close as 5 per cent, one of these 1 per cent lower, the other 2 higher. In all the others the conference rating was from 6 per cent to 17 per cent higher. As the conference used the abominable under 6 years age grouping and as many more children have been given toxin-antitoxin at age 5 than at any lower age, it is probable that the agreement is closer than appears.

As it is hoped to accumulate comparable data from a large number of places during the next few years, a high degree of uniformity in the method of collecting and tabulating immunization statistics is a necessity. It seems desirable, therefore, to describe in some detail the methods we have worked out in New York State during the past 7 years, not with the idea that they are necessarily the best, but because we probably have more data, tabulated uniformly, to serve as a basis of comparison than can be found anywhere else. Any community that has good primary records of toxin-antitoxin administration can with more or less trouble follow this system and determine its approximate immunization status as of any given date.

The primary data come to the local health officer from four different sources: The practising physicians, school clinics, regular children's clinics and special toxin-antitoxin clinics. Forms have been devised to facilitate record making for each of these but the form most widely used is known as Form 50; the "Request Card," which is adaptable to all purposes (Figure XIII). It is intended primarily for use by a canvasser who inserts names and ages on the front, secures the parents' signatures and notes on the back the time and place of the clinic the children are to attend. If they purpose going to a private physician, his name is entered in lieu of the clinic. The card is indexed by family name and taken to the clinic where the entries are made at the time the injections are given. On completion of the third injection it is transferred to a file for current completed cases where it remains until tabulated, after which it goes to the permanent file for completed cases. Other details are not germane to this discussion and are, therefore, omitted.

FIGURE XIII

NAME OF PARENT OR GUARDIAN.....

Family name	Given name	Age	Address	*T-A dates*			
				1	2	3	

REQUEST FOR INOCULATIONS

(1) I hereby request that my children be inoculated against diphtheria by Dr.....

(Guardian) (Parent)

(2) I hereby request that my children whose names appear above be given the protective injections against diphtheria at a clinic to be held in this community for that purpose.

(Guardian) (Parent)

Dated.....N. Y.,.....193.....

4-17-31-100,000 (17-7069)

The data come to the State Department of Health as simple tables on what is familiarly known as "Form One Forty" (Figure XIV). Only the figures in the first column are used and they are entered on work sheets as received and are tabulated monthly for purposes that need not concern us here. Annually or oftener as occasion requires they are assembled into a table (Figure XV) for each place over 10,000 population and for each county exclusive of such places. This table shows the corresponding figures for the previous years in columns to the left. By drawing a line under the figure for age 4 of the last or current year, under age 3 for the next preceding year, under age 2 for the year before that, and so on, and then by connecting these lines by diagonals, the figures showing the number whose present age is under 5 become apparent and are easily added together. A similar line starting under age 9 will indicate the figure for the 5–9 group. By consulting the "Form One Forty" reports and noting the months covered by them refinement is possible. It is used in special cases, as for example, in Figures II to XII illustrating the experiences of cities in New York State. It is unnecessary to go into details for after all we are dealing with approximations and refinement is rarely justified.

It is now proper to rationalize the hypothesis, to offer an explanation of how it is possible by immunizing a fraction of the population to decrease materially the incidence of such a disease as diphtheria. It seems to be generally accepted that all that active immunization does is to prevent the development of an *attack* of clinical diphtheria; that

FIGURE XIV

Form C. D. 140. 4-17-31-10,000 (17-7070)

NEW YORK STATE DEPARTMENT OF HEALTH

DIVISION OF COMMUNICABLE DISEASES

SUMMARY BY AGES OF TOXIN-ANTITOXIN IMMUNIZATIONS AND SUBSEQUENT SCHICK TESTS

Town / Village / City ..... Co. ..... Month of ..... Year .....

Physician in charge .....

Name of school or institution .....

Total enrollment ..... Enrollment under 10 years of age .....

AGE IN YEARS	TOXIN-ANTITOXIN INJECTIONS			SCHICK TEST AFTER TOXIN-ANTITOXIN		
	Number of Children receiving			Number tested	Number positive	Number negative
	3 doses	2 doses only	1 dose only			
Under 1						
1 year						
2						
3						
4						
5						
6						
7						
8						
9						
10–14						
15–19						
20 and over						
Total						

REMARKS (*Note unusual reactions or any other items of interest*)

it does not prevent the individual from becoming a carrier. It is by no means certain that this is so, the little evidence we have on the point being equivocal. The subject is one for further study.[4]

A reduction in the carrier rate, however, even if it occurs, is probably a relatively minor factor. It may operate to keep the rate below the threshold of epidemicity as suggested by Glover[8] for meningitis but it seems to me more probable that the carrier plays a relatively beneficent rôle as the cheapest source of naturally acquired immunity.

As Doull and Lara[6] have shown, the incidence of secondary cases in families with reported clinical cases of diphtheria is at least 10 times and is probably more than 15 times as high as in families with carriers. As compared with families in which carriers were not known to exist, they concluded that families of carriers incurred a small but distinctly greater risk.

The secondary carrier rate in these carrier families and the Schick reactions of the contacts before, after and during the period of exposure are not given. We know from Frost[7] that about 47 carriers develop for every case that develops from the casual exposures of school children while only 6 carriers develop for every case that develops from exposure to known cases. *In other words, carriers tend to develop carriers* and presumably immunity, *while cases have a much greater tendency to develop new cases.* These observations pointing to the innocuousness of the individual carrier as compared with the individual case do not, of course, rule out the carrier as the principal source of recognized diphtheria. The Baltimore studies indicate that only about 23 per cent of the recognized cases can be traced to a previous case, the inference being that the remaining 77 per cent are due to contact with carriers. Though a large city is not the best place in which

FIGURE XV

Utica, 1925–1930

Persons having received three doses of toxin-antitoxin, by age

Age at time given 3 doses	Year in which given three doses					
	1925	1926	1927	1928	1929	1930
All ages	2941	4943	6313	1470	663	4526
Under 1 year	—	115	272	206	224	474
1	—	64	283	127	135	285
2	1	244	472	77	88	274
3	7	240	513	60	64	248
4	32	240	480	76	53	260
5	201	412	707	98	47	476
6	291	427	654	74	32	572
7	365	484	539	73	5	564
8	368	496	445	51	10	470
9	379	474	384	18	4	380
10 and over	1,297	1,443	1,450	32	1	523
Unstated	—	304	114	578	—	—

1931 population under 5 years = 7,708	Graduated as of January 1, 1931	
	All ages	20,856
$\frac{3,132}{7,708} = 41\%$	Under 1 year	474
	1	509
	2	615
	3	735
	4	799
	Under 5 years	3,132
	5–9	7,056
	10 and over	9,672
	Unstated	996

to attempt this sort of a determination yet, as far as *sporadic* and *endemic* cases are concerned it seems logical that the vast majority are due to carriers.

It does not follow, however, that the cases occurring during a period of high prevalence are mainly due to carriers and I can see no reason for the apparent results from immunizing a minor fraction of the child population if this be true. It would seem that the result must come from the prevention of cases. As the known cases cannot be held responsible for the spread of the disease, it follows that the great majority of these cases are not recognized as diphtheria. They are probably then atypical, the so-called larval cases, the cases that are not seen by a physician, that are missed unless an assiduous search is made for them. As the immunization of a small fraction of the under 5 age group seems to produce a more marked effect than a larger fraction of older children, it seems likely these cases exist in greatest numbers in this youngest group.

One of the rarest types of diphtheria reported to health departments is nasal diphtheria. I refer particularly to the type in which the infection is limited to the anterior nares. This condition is usually extremely mild and yet is said to be very common among infants and younger children. If in taking routine cultures they are found to harbor diphtheria bacilli they probably are classed as "carriers" though there is little doubt that the discharge is due to an underlying pathology due to the diphtheria bacillus. I have some evidence that these cases do not occur in children with antitoxin immunity. These cases are especially dangerous because—(1) they rarely suffer from toxemia and hence move about freely, and (2) the infectious discharge is on the surface where it is readily available. It is perhaps the prevention of a considerable number of such cases that stops an epidemic.

SUMMARY

1. The injection of 50–70 per cent of children over 5 years old with 3 doses of toxin-antitoxin has failed in numerous instances to produce any marked effect on the diphtheria incidence of a community.

2. The immunization of 30 per cent or more of children of the under 5 age group in addition to more than 50 per cent of children 5–9 has in several instances produced an immediate and striking decline in the diphtheria rate of the community as a whole.

3. The promptness of this seeming response suggests that a high degree of immunity is quickly acquired by a majority of those given 3 doses of toxin-antitoxin. It is a matter probably of a few weeks rather than several months. The point is worthy of further investigation.

4. In only 2 instances known to the writer has a community that had attained 30 per cent immunization of its under 5 age group suffered even a moderate epidemic.

5. It is possible that immunization of the under 5 age group should not be uniformly distributed through the community, but should be largely concentrated in sections of highest prevalence if diphtheria is prevalent; if not, then in the congested areas.

6. This study is presented as a working hypothesis, worthy of trial as a means of quickly ridding a community of epidemic diphtheria. Much more data from more varied sources are necessary to establish its validity. To this end uniformity in the tabulation of immunization statistics is a necessity. The Committee on Administrative Practice and all health departments should adopt the standard age grouping in their tables, should classify immunizations by single years of age up to 10 years and should annually or oftener so tabulate their material as to show the present status.

7. It is suggested that the unrecognized case rather than the healthy carrier is responsible for the occult infections occurring during epidemics or periods of high prevalence. It seems not improbable that many mild nasal cases would be discovered if diligently sought. Such cases are the ones most likely to spread infection.

Finally it should be clearly understood that this presentment is in no sense a plea for any community to stop work when it has attained a 30 per cent immunity. That figure may be much too low. Active immunization, like antitoxin, was introduced on a wholesale scale during a period when diphtheria was receding from a period of high epidemicity. It is, therefore, the more difficult to measure its effect. The immunity conferred may not suffice for an organism of greater invasiveness, virulence, and pathogenicity.

In any event, the only reasonably sure protection for the individual is individual immunization. The one unvaccinated individual in the city may be the gas station man who serves an itinerant smallpox case. The one infected mosquito may bite a susceptible.

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Numbers of Bacteria in Frozen Food Stored at Several Temperatures*

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THE introduction of new methods commonly known as quick freezing has given a decided impetus to preservation of food by storing in a chilled or frozen condition. The early development of the process was carried out for the preservation of fish but it has been modified for meats and more recently for vegetables and fruit. In addition to the introduction of quick frozen natural products, many varieties of berries and fruits have been packed in sugar and frozen. This product was developed to provide uncooked fruit for ice cream manufacturers and is extensively used in bakeries and for other manufacturing processes.

While much progress has been made in the experimental development of preservation by freezing, and recent merchandising experiments have shown that the products are well received by the public, there is every indication that still wider application will lead to new products and to tremendously larger sales in the fields already explored.

The general practice is to freeze the product at or near the point of production and then store it, as opposed to the former procedure of storing food in a warehouse and then freezing. In general, the newer products are carefully packaged and are ready to be sold by the retailer without any further preparation. Many have been sold in a frozen condition although some are thawed of necessity, facilities for maintenance in a frozen condition being lacking, and some are thawed to make them more acceptable to the customer. The temperatures for freezing and storage are, in general, considerably lower than those formerly employed.

The products are so new that no markedly different household

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procedures for handling have come into use; they are being treated in approximately the same manner as though fresh. This has, in general, been satisfactory.

The exact character of the changes in food products during the stages of preparation, freezing, storage, and transportation, have not been well established. Criterions of fitness have not been widely published, but it is obvious that control of the manufacturing and merchandising of these products requires definite standards in the interests of public health. Before these can be set a large volume of information is needed concerning the natural changes which take place under carefully controlled conditions.

EXPERIMENTAL PROCEDURE

In an attempt to secure general and specific information on the matter, it was determined to obtain samples of commercially frozen food, wherever possible, and expose them to conditions that would simulate the expected retail storage conditions. By observation over a long period, it was believed that changes would be measurable, and that by correlation of these, some standards for satisfactory storage could be set up.

This paper is a preliminary report and includes data on 6 articles: haddock, lamb chops, spinach, strawberries, raspberries, and orange juice, selected as representing the classes of foods most often treated by this process. With the exception of the orange juice, all samples were quick frozen by the Birdseye process, and were received in the laboratory in a condition similar to that which would be expected if they were being removed from the storeroom for distribution to the retail dealer. Although some were freshly frozen, all had been kept at very low storage temperature, probably —29° C. (—20.2° F.). The samples of orange juice came from two plants that were freezing the juice commercially, and were shipped with dry ice refrigeration.

On receipt in the laboratory, samples were divided and stored in Frigidaire cabinets at temperatures of approximately —18° C. (0.4° F.); —12° C. (10.4° F.); —6.6° C. (20° F.).

Examinations were in general made at intervals of 1 week at the start, which were lengthened to 2 or 4 weeks as the test progressed. The bacterial examinations were made by cutting aseptically a piece of approximately 5 gm. This was weighed in a sterile mortar, ground with sterile sand, and the whole transferred to a dilution bottle. Dilutions and plating were carried out in the usual manner. Difco nutrient agar was used. The plates were incubated at 25° C., and in some cases duplicates at 37° C.

DISCUSSION

The bacteriological examination was on successive samples rather than successive tests on the same sample. As they were all commercial or semi-commercial it would be expected that they might vary in the number of bacteria, and therefore the numbers recorded on the various examinations might be expected to fluctuate. In products that showed wide variations in numbers before freezing, such fluctuations would be particularly noticeable. The order of magnitude is therefore of more significance than the actual counts. A brief statement of the trend of bacterial numbers for each food will perhaps be most useful in presenting the facts.

Lamb Chops—The numbers of bacteria present in lamb chop fat (Table I) were not particularly high in any case. In general, a reduction at all storage temperatures is shown. At —6.6° C. there is an indication of an increase through the 2d week followed by a decrease. At —12° C. a similar condition occurred with a peak at the 4th week, though it is difficult to know whether this is a true peak or an erratic high count. At —18° C. the counts are very irregular and it is not easy to draw any conclusion except that the temperatures may have held the numbers so nearly constant that they reflect the original bacterial content more truly than do the higher temperatures. No counts were made on the lean portion of the chops.

TABLE I

BACTERIA IN THE FAT OF QUICK FROZEN LAMB CHOPS AT 3 STORAGE TEMPERATURES

Numbers of bacteria per gm.

Storage Time	−6.6° C.	−12° C.	−18° C.
Start	107,000	107,000	107,000
1 week	359,000	41,200	169,000
2 "	472,000	222,000	89,200
4 "	101,000	346,000	145,000
6 "	38,300	44,400	67,700
8 "	69,100	61,200	26,400
10 "	14,000	46,300	46,100
12 "	3,950	56,500	191,000

Strawberries—The numbers of bacteria in the strawberries (Table II) were quite low for the most part. There were noticeable reductions at —6.6° C. and —12° C. There are indications that the reduction was more marked and quicker at the higher temperatures. There was little change at —18° C. A possible cause of this apparent anomaly will be discussed later.

TABLE II

BACTERIA IN QUICK FROZEN STRAWBERRIES AT 3 STORAGE TEMPERATURES

Numbers of bacteria per gm.

Storage Time	−6.6° C.	−12° C.	−18° C.
Start	1,900	1,900	1,900
1 week	2,000	2,180	2,520
2 "	700	1,400	2,670
4 "	400	680	830
6 "	280	960	2,200
8 "	700	750	1,000
10 "	—	503	2,000
12 "	183	—	1,780

Raspberries—Table III indicates that most of the findings noted for strawberries hold for raspberries, except that in a few instances considerably higher counts were obtained.

TABLE III

BACTERIA IN QUICK FROZEN RASPBERRIES AT 3 STORAGE TEMPERATURES

Numbers of bacteria per gm.

Storage Time	−6.6° C.	−12° C.	−18° C.
Start	50,500	50,500	50,500
1 week	29,200	984	10,800
2 "	1,170	739	3,830
4 "	—	523	313
6 "	275	638	1,520
8 "	726	4,720	1,220
10 "	104	631	1,380
12 "	9,770	709	786

Spinach—The counts for spinach (Table IV) were in general somewhat higher than for strawberries and raspberries. The numbers at −6.6° C. include several counts that were noticeably higher than at either of the lower temperatures. Counts at −12° C. and −18° C. were fairly uniform and probably indicate there was very little change in numbers.

Haddock—The counts on frozen haddock (Table V) were in general more uniform. The incubation temperature was 37° C. as contrasted with 25° C. for all the other foods. Later work has shown that this temperature is not satisfactory and probably explains the low initial count, as the fish had been kept at extremely low temperatures with dry ice for a number of hours during shipment.

TABLE IV

BACTERIA IN QUICK FROZEN SPINACH AT 3 STORAGE TEMPERATURES

Numbers of bacteria per gm.

Storage Time	−6.6° C.	−12° C.	−18° C.
Start	2,170	2,170	2,170
1 week	5,430	1,100	2,920
2 "	4,110	3,310	1,200
4 "	11,700	4,330	2,590
6 "	1,190	1,350	1,350
8 "	4,720	1,530	6,530
10 "	11,400	1,700	—
12 "	1,190	1,040	2,980

Disregarding some irregular high counts the numbers in the —4° C. samples were low. The numbers in the —6.6° C. samples apparently show a continuous reduction. At —12° C. the numbers were never high, and there were indications of a gradual reduction. The counts on the —18° C. samples were too irregular and too scattered to warrant definite conclusions.

Orange Juice—The counts on frozen orange juice were somewhat irregular, due, it is believed, to irregular infection during processing and differences in sampling. There were definite indications that constantly higher counts were obtained from samples stored at lower temperatures.

In general, the results obtained did not indicate any continued increase in organisms at the temperatures studied. There were very definite indications that reductions occurred as storage time increased.

TABLE V

BACTERIA IN QUICK FROZEN HADDOCK AT 4 STORAGE TEMPERATURES

Numbers of bacteria per gm.

Storage Time	−4° C.	−6.6° C.	−12° C.	−18° C.
Start	47	47	47	47
1 week	2,136	5,300	830	—
2 "	227	1,600	790	—
3 "	1,400	1,700	710	1,300
4 "	560	972	740	—
7 "	260	820	560	75
9 "	2,670	5,780	523	1,600
13 "	254	176	257	87
17 "	32,100	2,900	4,500	600
21 "	380	42	80	90
25 "	130	76	100	—

TABLE VI

MICROÖRGANISMS PRESENT IN FROZEN ORANGE JUICE AT 3 STORAGE TEMPERATURES

Orange Juice "E"

Number of organisms per c.c.

Storage Time	−6.6° C.	−12° C.	−18° C.
Start	113	113	113
9 days	323	485	645
19 days	65	141	367
38 days	65	258	154

Orange Juice "G"

	−6.6° C.	−12° C.	−18° C.	−29° C.
Start	2,410	2,410	2,410	2,410
12 days	760	740	3,330	—
20 days	1,100	1,090	1,160	1,340
35 days	750	1,110	3,450	—

The noticeably higher numbers of organisms in some of the foods stored at lower temperatures are not easily explained, but may be due to the fact that the particular foods do not furnish satisfactory soils for the organisms, and the lower temperatures delay the germicidal effects.

CONCLUSIONS

From the limited number of experiments it is difficult to formulate conclusions, but there is every indication that frozen food, if carefully prepared and stored, can be merchandised with an adequately low microörganism content. Fluctuations were noted at all storage temperatures studied.

The small numbers of bacteria present and the temporary slight increases noted do not seem sufficient to explain the chemical and physical changes (limited changes in pH, titratable acidity, weep, color, etc.) detected. The general decreases in numbers of bacteria noted make it seem still more unlikely that microörganisms are the sole or even the principal cause of these changes, which probably are enzymatic.

In certain foods the decreases in numbers of bacteria occur more rapidly and to a greater degree at the higher storage temperatures, and this may be due to the lack of the protective action of extreme cold against the unfavorable environment provided the organisms by the foods.

Bacteriological and Antigenic Analysis of Shigella Paradysenteriae Sonne Isolated from 9 Cases*

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THE importance of *Shigella paradysenteriae* Sonne † as the cause of acute and mild cases of diarrheal disease in this country has been emphasized by the investigations of Nelson[1] and MacKenzie and Batt.[2] As pointed out by Nelson, the association of late-lactose-fermenting organisms of the paradysentery group with diarrheal disease was first noticed by Duval and Schorer[3] in 1904. It was not until 1915 that Sonne[4] demonstrated as the main causative agent of dysentery in Copenhagen a late-lactose-fermenting bacillus which was serologically specific. A review of the literature is given by Nelson.[1]

S. paradysenteriae Sonne apparently may produce both extremely severe and mild cases of dysentery. In acute cases there is a sudden onset with epigastric pain, vomiting, diarrhea, and prostration, and death may result. On the other hand, the patient may recover, after a few days to relapse with the same symptoms. The temperature fluctuates between 100° and 104°. The mild cases do not exhibit particularly abnormal symptoms. The temperature rise is not as high, usually 100°–101°; vomiting and epigastric pain do not usually appear but the patient passes a number of loose, watery stools each day. The mild cases last a week or less. The organism can be recovered without difficulty from the patient's stools during the illness.

In this investigation 9 cases are recorded, 7 of which are from a single family exhibiting both mild and severe types of dysentery. One, 263A, was associated with some 150 other boys in a school in another state, all with a diarrheal disease, a number of similar cases occurring simultaneously in the town in which the school is situated. Since no examinations of feces were made, no epidemiological studies could be carried out. The other case occurred in a hospital in Hart-

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† Although for convenience the authors use the nomenclature suggested in *Bergey's Manual*, 3d ed., that they do not fully subscribe to his classification of this group of organisms is evident from the context.

ford, and was fatal. The following case reports are included as illustrations of the mild and severe forms of disease encountered.

Case 1.[8] B. C., age 4. July 24, 1930, taken suddenly ill with chills and high temperature (104°). Many loose watery stools streaked with blood. Severe intermittent pains through the abdomen which was tender to pressure without distention or rigidity. After 4 or 5 days, symptoms subsided, temperature came down to normal, and the child felt well. Two weeks later the same sort of illness recurred, with apparent recovery.

This case was typical of the 7 in the family. During August and September all other members of the family came down in turn, frequently 2 at a time. The children were ill more often than the adults.

Case 2.[8] R. D., age 16 months, admitted to hospital December 23, 1930. Rectal temperature 99.4°. No physical findings of significance. Child appeared well for 7 days; temperature normal. December 30, rectal temperature 100.2°, and child somewhat restless. Had several rather loose yellowish stools and was cross and irritable. There was a slight nasal discharge and a slight infrequent cough. The temperature rose rapidly to 103° and during the night 7 loose, yellowish evacuations showing no blood occurred. Temperature remained high, and patient died at noon, December 31.

No laboratory examinations were made during acute illness. Previous Wassermann and throat culture had been negative.

Cultures from the tonsillar exudate showed a mixed flora without any pathogenic organisms predominating. Culture from cecum showed *S. paradysenteriae* Sonne predominating organism, a few *Escherichia coli* and fecal streptococci.

A bacteriological and antigenic study has been made of all the cultures isolated since July, 1930, to determine whether they gave consistent reactions in carbohydrate media, to determine differential laboratory tests, and, to study the antigenic relationship of *S. paradysenteriae* Sonne to other members of the paradysentery group.

MORPHOLOGICAL CHARACTERISTICS

The isolation of *S. paradysenteriae* Sonne has been fairly simple. One gram of suspected feces was emulsified in 2 to 3 c.c. of isotonic salt solution, and 1 loopful streaked on petri dishes containing suitable media. Both eosin-methylene-blue agar and Endo's medium have been used with equal success. In 24 hours colonies of *S. paradysenteriae* Sonne appeared smooth, greyish white and translucent, 2–3 mm. in diameter, similar to other organisms of the dysentery group in morphology. After 48 hours the following characteristics were noted:

Eosin-methylene-blue agar—Colonies were 0.5 to 3 mm. in diameter, convex and translucent, with crenated edges in the majority. Some cultures had a tendency to produce a slight pale blue center, and some a fecal odor.

Endo's medium—Colonies were smooth, glistening, translucent, raised, with en-

tire edge, in size from 0.5 to 3.5 mm. No fecal odor noted. Crenated edge not observed. The colonies had a bluish tint in direct light, with tendency to develop pale pink centers.

Agar plates—Colonies varied from pin points to 4 mm.; with definite crenated edge; white, translucent and raised, with a pale blue tinge in direct light. A fecal odor was present in some cases.

Agar stroke—On agar slants the growth was echinulate, glistening, butyrous, raised, translucent, slightly granular under hand lens. The odor was not consistent but fecal when present. Figure I shows the type of growth on eosin-methylene-blue (A), Endo's medium (B), and agar (C).

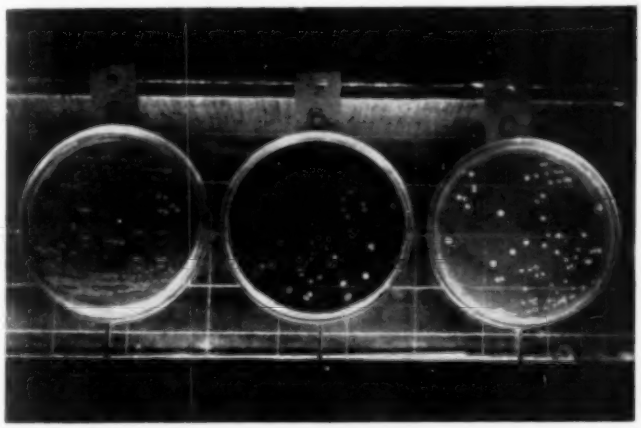

FIGURE I—*Shigella Paradysenteriae* Sonne on Eosin Methylene Blue, Endo and Agar Media

On microscopic examination the organism appeared as a Gram-negative, short, coliform bacillus with involution forms, the latter 5 or 6 times longer than the short bacilli which predominated.

PHYSIOLOGICAL CHARACTERISTICS

A comparison of fermentative ability was made between the cultures isolated and *"Metadysenteroides"* 4086, *S. paradysenteriae* Sonne 31, and *S. dispar 29*, of the American Type Collection. A series of carbohydrates including dextrose, lactose, sucrose, maltose, levulose, mannite, raffinose, salicin, galactose, sorbite, inulin, xylose, arabinose, adonite, inosite and rhamnose was inoculated and readings made daily for 21 days. Andrade's indicator was used in all carbohydrates. The methyl red, Voges-Proskauer, indol and Koser's citrate tests were made. The results are shown in Table I. It will be noted that dextrose, levulose, mannite, galactose, arabinose and rhamnose were fermented within 24 hours, whereas lactose, sucrose, maltose and raffinose were fermented late in the majority of cases. Sucrose seemed the carbohydrate which resisted fermentation longest.

More than one culture was isolated from most patients and these were inoculated into the carbohydrates in duplicate. Although the

TABLE I

FERMENTATIVE REACTIONS OF PARADYSENTERY ORGANISMS

Culture Number	Dextrose	Lactose	Sucrose	Maltose	Levulose	Mannite	Raffinose	Salicin	Galactose	Sorbite	Inulin	Xylose	Arabinose	Adonite	Inosite	Rhamnose	Koser's Citrate	Indol	Methyl Red	Voges Proskauer	Motility	Gram Stain
Metadysenteroides *	$A^{1\dagger}$	A^{1}	A^{6}	A^{1}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
Metadysenteroides	A^{1}	A^{1}	A^{6}	A^{1}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
Sonne 31 *	A^{1}	A^{6}	A^{6}	A^{7}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
Sonne 31	A^{1}	A^{6}	A^{6}	A^{6}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
Dispar 29 *	A^{1}	A^{2}	A^{2}	A^{1}	A^{1}	A^{1}	A^{9}	–	A^{1}	A^{1}	–	A^{1}	A^{1}	–	–	A^{1}	–	+	±	–	–	–
Dispar 29	A^{1}	A^{9}	A^{2}	A^{1}	A^{1}	A^{1}	A^{6}	–	A^{1}	A^{1}	–	A^{1}	A^{1}	–	–	A^{1}	–	+	±	–	–	–
416A	A^{1}	A^{3}	A^{6}	A^{6}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
416B	A^{1}	A^{1}	A^{3}	A^{3}	A^{1}	A^{1}	A^{3}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
417A	A^{1}	A^{1}	A^{2}	A^{3}	A^{1}	A^{1}	A^{3}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
417B	A^{1}	A^{7}	A^{9}	A^{6}	A^{3}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
450A	A^{1}	A^{1}	A^{7}	A^{2}	A^{3}	A^{1}	A^{4}	–	A^{1}	–	–	–	A^{1}	–	–	A^{2}	–	–	–	–	–	–
450B	A^{1}	A^{1}	A^{9}	A^{4}	A^{3}	A^{1}	A^{7}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
1640A	A^{1}	A^{6}	A^{10}	A^{1}	A^{1}	A^{1}	A^{9}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
1640B	A^{1}	A^{2}	A^{5}	A^{2}	A^{1}	A^{1}	A^{8}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
263A	A^{1}	A^{1}	A^{5}	A^{1}	A^{1}	A^{1}	A^{1}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
263B	A^{1}	A^{1}	A^{10}	A^{1}	A^{1}	A^{1}	A^{5}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
451	A^{1}	A^{7}	A^{17}	A^{1}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
413	A^{1}	A^{7}	A^{12}	A^{6}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
562A	A^{1}	A^{1}	A^{18}	A^{6}	A^{1}	A^{1}	A^{6}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
562B	A^{1}	A^{1}	A^{9}	A^{1}	A^{1}	A^{1}	A^{5}	–	A^{1}	–	–	–	A^{1}	–	–	A^{1}	–	–	–	–	–	–
165A‡	A^{1}	?	?	A^{1}	A^{1}	A^{1}	?	–	A^{1}	A^{2}	–	A^{2}	A^{1}	–	–	A^{2}	–	+	±	–	–	–
165B	A^{1}	?	?	A^{1}	A^{1}	A^{1}	?	–	A^{1}	A^{1}	–	A^{1}	A^{1}	–	–	A^{2}	–	+	±	–	–	–

* Cultures obtained from the American Type Culture Collection.
† Exponent designates number of days necessary to produce acid.
‡ Not classified.

final readings were the same, the time varied. For example, cultures 417A and 417B, isolated on different days from the same patient. Culture 417A showed formation of acid in lactose in 1 day and sucrose in 2 days, whereas 417B required 7 and 9 days respectively. These apparent discrepancies, noticeable throughout the investigation, emphasize the necessity of long incubation of these organisms in carbohydrate media.

An examination of duplicate cultures of *"Metadysenteroides"* and of *S. paradysenteriae* Sonne (Table I) indicates that their fermentation reactions are identical, whereas *S. dispar* has different reactions, the latter showing fermentation of sorbite and xylose and producing indol. The fermentative reactions indicate that *"Metadysenteroides"* and *S. paradysenteriae* Sonne are identical organisms, whereas *S. dispar* is quite different. Continued transplantations of the above cultures demonstrated the consistency of these fermentative reactions.

Cultures 165A and 165B were isolated from a case in a family from other members of which typical *S. paradysenteriae* Sonne had previously been isolated. It will be noted (Table I) that their reactions coincide in general with those of *S. dispar*. However, the amount of acid produced in lactose, sucrose, and raffinose was very small, and 20 daily transfers in those 3 sugars failed to increase the acid production. They were found to be serologically different from *S. dispar* (note Table II).

TABLE II

SEROLOGICAL RELATIONSHIP OF CULTURES ISOLATED. PARADYSENTERIAE SONNE, DISPAR AND "METADYSENTEROIDES" (AMERICAN TYPE COLLECTION) ARE INCLUDED

Culture Number	Antiserums (Titer)					
	Sonne (Prepared)	"Metadysenteroides" (Prepared)	Dispar (Prepared)	Sonne Secured from "Nelson"	Flexner (Commercial)	Shiga (Commercial)
Sonne 31	2,560 *	2,560	0	2,560 *	0	0
Metadysenteroides 4086	2,560	2,560 *	0	2,560	0	0
Dispar 29	0	0	1,600 *	0	400	0
416A	2,560	1,280	0	2,560	0	0
417A	2,560	1,280	0	1,280	0	0
450A	2,560	2,560	0	2,560	20?	0
1640A	1,280	2,560	0	2,560	0	0
263A	1,280	2,560	0	2,560	20?	0
451	2,560	2,560	0	1,280	0	0
413	1,280	2,560	0	1,280	0	0
562A	1,280	1,280	0	2,560	20?	0
165A	0	0	0	0	0	0

* Homologous antiserums.
NOTE: Figures represent greatest dilution in which complete agglutination appears.

SEROLOGICAL CHARACTERISTICS

Antiserums were prepared with 3 organisms obtained from the American Type Collection, *S. paradysenteriae* Sonne 31, *S. dispar* 29, and *"Metadysenteroides"* 4086, by inoculating rabbits every other day over a period of 20 days with increasing doses of heat killed organisms. Some difficulty encountered with culture 31, was overcome by the use of minute doses of living organisms. The animals, after 24 hours' fasting, were bled from the heart when a titer of approximately 2,500 had been reached.

Agglutination tests were made using the various cultures isolated and those from the American Type Collection. The results are given in Table II. Antigens for all agglutinations were prepared to correspond to a turbidity of 7.6 to 7.8 with the Gates'[6] apparatus. Titers

varying from 1,280 to 2,560 were obtained with all the cultures used except 29 and 165A; the former, *S. dispar*, and the latter a culture isolated from a case of diarrheal disease in a family from which a number of cultures of *S. paradysenteriae* Sonne had been isolated (note 417A and 451).

The cross agglutination between *S. paradysenteriae* Sonne 31 and *"Metadysenteroides"* 4086 would indicate that they are identical. This is corroborated by the reactions of the antiserums of these organisms with the cultures isolated in our laboratories.

A Sonne antiserum (Sonne Nelson, Table II) obtained through the courtesy of Dr. R. L. Nelson, of the Infants Hospital, Boston, showed reactions practically identical with those obtained with the *Sonne* and *"Metadysenteroides"* antiserums prepared in our laboratories.

Agglutinations were obtained with antiserums prepared with *S. dispar*, with its homologous antigen 1:1,600 and with a strain of *S. paradysenteriae* Flexner 1:150. It was found that a Flexner antiserum (Lederle) was capable of producing agglutination as high as the 1:400 dilution with a culture of *S. dispar* in comparison to 1:1,600 with its homologous antigen. No cross agglutination occurred with Shiga antiserum.

In order to study further the agglutination of *S. dispar* by Flexner antiserum, it was absorbed with Flexner organisms. The absorbed antiserum produced no agglutination with Flexner organisms but continued to give an agglutination of undiminished titer (1:400) with *S. dispar*. The absorption of dispar antiserum with its homologous organism produced different results in that no agglutination was obtained with either a dispar or a Flexner strain. On absorbing the antiserum with heterologous organisms the dispar strain was capable of partially absorbing Flexner agglutinins from the Flexner antiserum although our Flexner strain was incapable of absorbing dispar agglutinins from a dispar antiserum (Table III).

It was expected on absorbing Flexner antiserum with a Flexner antigen that because of their apparent cross relationship (note column one, Table III) the absorption would deplete materially the titer of the group or heterologous agglutinins, but although all the Flexner agglutinins were absorbed, the titer remained unchanged with the dispar strain.

The Flexner antiserum was prepared with 4 strains: (1) Flexner Harris, Rockefeller Institute; (2) Strong, Army Medical Museum; (3) Hiss Y., Army Medical Museum; (4) Flexner, Army Medical Museum. (Personal communication from the manufacturer.)

Since absorption of this antiserum with our single Flexner strain

TABLE III

SEROLOGICAL RELATIONSHIP OF *S. Paradysenteriae* FLEXNER TO *S. Dispar* (AMERICAN TYPE COLLECTION)

Organism	Antiserums					
	Flexner	Dispar	Flexner absorbed with Flexner	Flexner absorbed with Dispar	Dispar absorbed with Dispar	Dispar absorbed with Flexner
Flexner	1,600 *	150	0	800	0	0
Dispar	400	1,600	400	0	0	1,600

* Figures represent complete agglutination.
NOTE: The Flexner antiserum was obtained from Lederle. The dispar antiserum was prepared in our Laboratories with a strain obtained from the American Type Collection.

did not deplete the dispar agglutinins (Table III) the evidence indicated that one or more of the strains used by the manufacturer were multiple antigens, with respect to dispar; i.e., had the ability to produce agglutinins for dispar as well as Flexner. Further, our stock Flexner strain used for absorption is apparently a pure antigenic strain with respect to dispar since it was not able to deplete the dispar agglutinins in the Flexner antiserum although absorbing completely its homologous agglutinins. This is corroborated by absorbing a dispar antiserum with our stock Flexner strain. In this case (Table III) all the Flexner agglutinins were removed whereas the dispar titer remained the same. Since our dispar serum (prepared with *S. dispar*, American Type Collection, showed cross agglutination with our stock Flexner strain, and the dispar organism is capable of depleting Flexner agglutinins in the Flexner serum the evidence indicates that this organism contains a multiple antigen for Flexner. This is corroborated by absorption of dispar serum with its homologous antigen since in this case the agglutinins for both Flexner and dispar were completely removed. The multiplicity of antigen in the Flexner-dispar series is being investigated further.

DISCUSSION

Relatively little work has been done in this country on *S. paradysenteriae* Sonne. However, the recent work of Nelson[1] indicated its importance as a cause of diarrheal disease in Boston, and it is the purpose of this investigation to emphasize further that this organism has greater significance as a cause of dysentery than has been suspected. Since mild forms of the disease characterized by diarrhea, headache, and slight abdominal pain with little fever clear up quickly,

it may be that a large majority of cases of diarrheal disease are due to this organism.

We found the laboratory diagnosis comparatively simple. The colonies of *S. paradysenteriae* Sonne are striking on differential media such as eosin-methylene-blue or Endo's medium, and the growth is vigorous on the more common media. The fermentative reactions were consistent and although the time required for a given carbohydrate to be acted upon varied, the end results were identical.

Separation of the Sonne and dispar strains is readily accomplished by their fermentative and serological reactions. No serological relationship was shown between our Flexner and Shiga strains and *S. paradysenteriae* Sonne although a distinct cross agglutionation of a Flexner strain and *S. dispar* was demonstrated.

Our results corroborate those of Nelson[1] in that *S. paradysenteriae* Sonne 31, and *"Metadysenteroides"* 4086 described by Castellani, appear to be identical in fermentative and serological reactions whereas *S. dispar* (Andrewes) gave distinctly different reactions.

Cultures 165A and 165B (Table I) have remained unclassified. Although giving reactions consistent with *S. dispar* no serological relationship could be demonstrated. Further work is being done on this organism.

SUMMARY

1. Nine cases of diarrheal disease caused by *S. paradysenteriae* Sonne are reported.

2. A detailed, morphological, physiological and serological study is presented.

3. The American Type Collection Cultures *S. paradysenteriae* Sonne 31 and *Metadysenteroides* 4086 appear to be identical in their fermentative and serological reactions.

4. *S. dispar* 29 appears to be distinct from *S. paradysenteriae* Sonne in its serological and fermentative characteristics.

5. A serological relationship between *S. paradysenteriae* Flexner and *S. dispar* is demonstrated by direct agglutination and by agglutinin absorption.

6. Further emphasis is placed on the significance of *S. paradysenteriae* Sonne as a cause of diarrheal disease in this country.

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Health Facts—What to Tell*

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WHAT to tell—not how to tell it—that is the question. Of course, in the final analysis, what to tell depends in part on whether or not it can actually be made intelligible to the man in the street. Consequently, even from our angle, we cannot altogether ignore the question of application.

In appraising so-called health facts, we want to be certain that they are true and that they are important. But truth is relative, particularly in point of time. What is true for one generation is not true for the next. The evolution of "factuality" is like the evolution of morality. Both are always in transition. That is perhaps why facts, like moral values, are not often pure white or jet black but, to paraphrase the "Old Fra," usually a rather slaty gray. That is perhaps why in public health as in other movements, it is often easily possible to give an aura of reality to what is mostly fiction.

VARIETIES OF HEALTH "FACTS"

Yet in the field of health and disease, there are always a few things about which we are quite certain, even though the professor of medicine is accustomed to initiate his first series of lectures with the warning that, in medicine, there are two words rarely applicable; namely, "never" and "always." In any event, it is certainly true that a consensus of scientific opinion, approaching the data used in health education on a factual basis, would be willing to throw most of the items, legitimately or erroneously used as facts, into several groups:

1. Items in health practice that, certainly for our times and as far as we can see for the future, are scientifically certified facts.

2. Items whose probability is large, but where we are not quite certain of our facts. This group may include items that a previous generation accepted without question, but which we now may be unlearning, so to speak. It may also include a group of near facts that increasing experience seems to make more and more probable, but about which we as yet have no final proof.

3. Items extensively used as facts, especially for commercial exploitation, but

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which we know either to be erroneous, or at least employed with misleading and perverting aims.

As the field of admitted scientific factual data enlarges and progresses, it acquires in advance of it new facts, as theories and hypotheses are underwritten by investigative verification. In its trail, it sheds once accepted facts into a region of doubt, and may be said always to be acquiring new fallacies for old.

NEW FALLACIES FOR OLD

We once, many years ago, wrote an article on the subject of health fallacies, in which attention was paid to "disease germs that lurk in dark and damp places," the alleged dangers of sewer gas, and the excessive proportion of health department budgets that was then spent for plumbing inspection. We also touched upon the exaggerated importance of housing equipment over the more significant items of living methods. In the intervening years, these fallacies have entirely receded into the periphery of doubt and darkness, and no longer require destructive attention. In fact, we may now more usefully attack certain more recently suspected fallacies, such as "the clean tooth never decays," or the myth about underweight as a guide to the detection of tuberculosis in school children. The fallacy of this much respected theory has been brought out very effectively by the work at the Phipps Institute in Philadelphia on tuberculosis among school children. It has perhaps been even more dramatically emphasized in the study of 1,000 supposedly normal adolescent children in the schools in the Bellevue-Yorkville District of New York City. You will remember that of 1,000 children carefully examined with the X-ray, tuberculin test, and the fluoroscope, 184 were placed in what was known as the tuberculous group—not active tuberculosis alone, of course, but latent or grave quiescent lesions, or arrested conditions requiring continued observation and hygienic care. Now, it is significant that among these 1,000 children, there were 128 who were 10 per cent or more underweight, but only 18 of the 184 tuberculous children were in this group of 128. In fact, more tuberculosis was found among the overweight children than among the underweight. Consequently, an alleged health fact tremendously exploited throughout the schools of the world, becomes very nearly, if not quite, a health fallacy.

It is our obligation to discuss health facts rather than health fallacies. Nevertheless, we cannot resist the temptation to cite one additional widely advertised "health fact" that seems in part to be fallacious: the often cited, ever increasing tide of the so-called principal cause of death, namely, heart disease. Is this a reality? Certainly,

the general death rate for all forms of heart disease at all ages has been steadily increasing. Two years ago, for the first time in several years, there was a break in this upward curve, perhaps only temporary, yet worth watching. On the other hand, we must realize that this heart disease picture is made up of 3 principal elements.

First, it includes children and young adults under 45, where deaths from heart disease are a tragedy and a disaster. Perhaps in most cases, the etiological factors here are the acute infections resulting in heart tissue injury. Prevention largely involves the control of these infections. The incidence of these infections, such as diphtheria, scarlet, typhoid, and acute rheumatic fevers, is markedly decreasing, a factor that may be related to another significant observation, the recent very definite decline in heart fatalities at these ages. This, the most important age group sector in the heart disease range, presents a trend that is not only not alarming, but decidedly reassuring and encouraging.

Second, the heart disease picture also includes the age group from 45 to 65 or 70, where deaths from heart disease are certainly unfortunate. It is thought that they result partly from acute infective injuries, but more from syphilis. Prevention means mainly the control of syphilitic infection, and particularly the prevention of the advanced stages of syphilis by detection and adequate treatment. Is it possible materially to affect heart disease mortality in this middle age group by these control measures as well as by personal hygiene, the periodic health examination, or the practice of physiological thrift? That seems probable, so that here too, as well as in the younger age group, the picture is not discouraging.

Third, the heart disease picture includes, of course, the senescent, old-age, degenerative type occurring usually beyond 65 or 70. Deaths from heart disease in this age group are increasing, and are inevitably bound to increase as the population ages, and as larger groups survive to invade this age period. Heart failure is an inevitable incident in this age group. On the other hand, here it certainly is not a tragedy as it is among young adults, nor the unfortunate factor it is in the middle age population element. In fact, it is almost a natural process, and in a great many cases, a benign, beneficent process, furnishing an easy and painless as well as an unprotracted termination of life.

From the point of view of health facts, it is important to distinguish between these 3 elements. To present the general combined death rate from heart disease as an increasing and inevitable menace is obviously misleading and unduly discouraging. The increasing rate is real, but is neither altogether deplorable nor alarming. Furthermore,

it is certainly in part the inevitable and desirable *sequitur* of disease prevention and life prolongation in the earlier age groups. This is a case where analysis and appraisal are essential to the presentation of a true picture for public view, and indeed for constructive, hopeful action.

GRADE A FACTS

But let us come to the kernel of our story—to the factors in our health educational program that can today, at least with reasonable confidence, be labelled Grade A facts. Obviously, we cannot attempt to list all of the items that in our opinion could now be classified as Grade A; yet all items employed by health educational agencies in their programs should regularly be scrutinized from this point of view. Here are a few examples of Grade A facts, yet even to these there probably would not be universal acquiescence.

Take the question of diet. There is, of course, a great deal we do not know about nutrition, yet we seem to be quite certain that a balanced ration is of fundamental importance to health. This idea seems to be generously supported both by animal experimentation, and human experience. Dr. Sherman and others have pointed out that apparently for normal life and growth, for disease resistance, and for tissue health, we must have at least a minimum supply of calcium, and possibly other minerals, and of the vitamins, perhaps particularly A, C, and G. Consequently, health education that interprets this point of view of science in practicable and intelligible statements, would seem to be based solidly, for the time being at least, upon health facts.

There seems also to be a high degree of certainty as to the hygienic and therapeutic value of sunlight, within fairly definite limitations. While widely exploited for commercial ends, sunlight, either natural or artificial, seems to be a definite aid to health and strength when properly used. We need here, of course, careful delimitation and definition, but with scientific guidance, there is much that can be said with assurance.

Let us consider communicable disease. There is much that seems to be incontrovertible within the limits of our present knowledge. We have many positive facts concerning the sources and modes of infection. Much has been proved about water and milk supplies as mediums of infection, and about carriers in typhoid fever, diphtheria, and other affections. We can speak with definiteness concerning the importance of protecting infants from contact infection in such diseases as measles and whooping cough. We know that it is important to advocate the washing of hands before eating and after using the toilet. There is much that can be said with assurance to parents con-

cerning the proper care and treatment of, as well as the convalescence from such a disease as measles, not so much to prevent infection, as to prevent complications, serious sequelae, and fatalities. Finally, on the side of prevention, we have very definite facts to offer the public in the field of immunization as applied to diphtheria, smallpox, and typhoid fever, and, with somewhat less positiveness, to measles, scarlet fever, and certain other conditions.

FACTS HANDICAPPED BY METHOD

Still in the field of what may be considered Grade A facts, there is a fluctuating volume of health promotive and disease preventive educational items that has, in theory, full scientific support, but whose effective application is handicapped by a serious limitation, or an inherent frailty in method of use; for example, the movement for early disease detection. Much is being said to the public about early diagnosis, and to the medical profession about so-called pre-clinical medicine. The slogan is "Find disease early," and to some extent this is a sound objective. Certainly many affections can be diagnosed, treated, and arrested or cured at a much earlier stage than the usual course of events permits. Examples of this are an incipient tuberculosis, a localized cancerous growth, an early pancreatic, or cardiac, or nephritic affection.

The medium advocated is the periodic health examination—a medium sound in theory, but as yet very frail in practice. The public is not yet educated to go to the doctor early enough; the doctor not yet sufficiently interested or informed or equipped to carry out the requisite examination and tests; and few communities have the necessary machinery to guide the individual to legitimate private or publicly organized sources of such service. Hence, the machinery for applying perfectly good health facts is, in this instance, very defective, and still constitutes a serious handicap upon what is theoretically a perfectly reasonable program.

Of course, the periodic health examination movement comes in for considerable criticism, not only from the lay public on the grounds of inadequate execution, but also from the professional side. It has been claimed by prominent authorities that the possibilities of early disease detection have been grossly exaggerated, which may to some extent be true. Undoubtedly, here our health facts are not quite so absolute as we should like to have them. It is also claimed that this health examination movement has certain very distinct psychological disadvantages; that it places too much emphasis upon physical welfare and physical symptoms; that it excites too much curiosity, fright, and in-

trospection; that it causes as much harm through worry as it does good; that it is, in other words, injuriously and often disastrously suggestive.

On which side of this argument does fact lie? It is no doubt true that most of us are open to influence by suggestion, but the principal question seems to be, where shall we get our suggestions? Shall they come to us from a scientific source through the physician on a basis of knowledge and fact, or through quackery, backfence gossip, patent medicine advertisements, and the ignorant imaginings of uninformed minds? It would seem that the former alternative is preferable, and is on the factual side. If that is true, we should teach the public not to be afraid of facts. Facts should furnish a relief from unfounded fears, and afford an opportunity to face genuine dangers intelligently.

In this general health educational movement for early disease detection via the health examination, it is important to be sure as to what diseases are detectable in their incipiency, and to what degree—certainties which we do not as yet possess. It is equally important to recognize that in this movement we are very decidedly limited by method, and that our educational program should not step too far in advance of the development of assured technical and clinical procedure. Yet facts there are, and worthy of constructive if conservative use.

Incidentally, it should also be recognized that there are some health facts that are not applicable for general public dissemination. Not all facts are for all people at the same time. While it is highly desirable to reach all mothers with a message on diphtheria immunization, for instance, it is not necessary to tell all mothers, with the same force and authority, about the use of convalescent serum or whole blood for the prevention of measles, or its complications. It may be desirable, in a still more limited way, to be able to instruct a few people in certain of the health facts concerning personal hygiene, not in large groups, but perhaps even individually through the physician or health adviser. Here again, it is not so much the facts that are lacking as the machinery.

There should exist in every community the facilities for individual medical and health guidance. General broadcasts by radio, through literature, the press, advertisements, and all the wholesale devices available, will not serve to answer intimate personal questions on health and disease prevention. The private physician should eventually fit in here most effectively. In the meantime, people are seeking this kind of individual advice, and it is only through the development in communities of facilities for individual medical and health guidance, preferably, to my mind, under the auspices of county medical societies, that this need can be met. Only in this way can our store of health knowledge, whatever its limitations, be utilized to the full.

THEORY VERSUS PRACTICE

We have cited examples of facts that are applicable in theory, but not always in practice, owing to difficulties of procedure. This aspect of the problem may be illustrated from still another angle. Back in 1904 or 1905, when the first tuberculosis organizations were formed, and when health and medical organizations were just beginning to anticipate the possibilities of the application of bacteriological knowledge of the cause of this disease, health propagandists aroused unusual enthusiasm concerning the early control and eradication of this great cause of sickness and death. About 1908 a slogan was adopted in an eastern state, "No Tuberculosis by 1915." Of course, everyone knew that this probably could not be attained, but it served a valuable purpose by emphasizing the theoretically attainable goal. In 1925, or shortly after, another slogan was adopted: "No Diphtheria by 1930." This was another commendable manifestation of hitching a wagon to a star. Goals, after all, are to be striven for, not always to be attained. "El Dorado lies always over the next hill." Up to the present, this method of featuring a theoretical health fact has had remarkable educational advantages, and has certainly furthered the ultimate attainment of the objective.

We should perhaps, from this point on, be somewhat on our guard with programs of this type. While they have been almost wholly advantageous in the past, may they not present a hazard for the future? Should we not be more cautious in our popularized forecasts? It is true that the public memory is short. It may become enthusiastic about the objective, sympathize with the methods, give generous financial and moral support, and then readily ignore the fact that the goal was after all not reached. Yet is it not possible that if we prod this frail public memory too frequently with repeated reminders of failure, not only through time limit slogans, but also through explosive health campaigns, health weeks, and similar concentrations, where the promise is not and almost always cannot be fulfilled, are we not apt to arouse a disquieting and disillusioning train of recollections in the public—a circumstance that would certainly produce a diminishing return in coöperation, or perhaps even a repudiation of leadership? Of course, the public responds more to slogans than to a scientific statement of probability; so we are handicapped in all of our work in this field by the necessity for simplicity.

It is evidently necessary to be assertive and dogmatic. However, there is some admitted hokum in our health educational program, and the public is in a debunking mood. Let us therefore keep, so far as possible, within the realm of the attainable in our prognoses as to the efficacy of our programs.

GRADE B—NEAR FACTS

Thus far, except for our earlier discussion of new and old fallacies, and of the general region of doubt which surrounds the factual health field, we have been discussing Grade A facts—things which we think are almost if not certainly true, but which may be seriously limited in their application for the reasons cited. In the health educational field, as we implied in the beginning, there is another, even larger, body of very appealing items—things which we generally believe to be true, which we would very much like to have true, but which, in the majority of instances, we cannot actually prove. One can pick up almost any health publication from any legitimate agency, official or private, and find examples of this type of health statement.

I have before me at present a bulletin of an official department in Washington. It contains a list of rules for health. One is: "Drink at least 4 glasses of water a day." Sometimes this rule reads 6, and sometimes 8 glasses a day. This sounds like good advice, but have you ever attempted to verify it on a basis of scientific experiment, except perhaps for certain pathological conditions, such as a case of nephrolithiasis?

Another bulletin, from a very responsible organization, states that practically everyone needs an average of 8 hours' sleep every night. This we have found somewhat difficult to verify. Then, take fresh air—how frequently have you read and also said that fresh air prevents colds, and "catching" diseases like tuberculosis? What do we really know about colds, for instance, in this connection? Then, exercise—"There is no better way to prolong life." Of course, there is no better way to shorten life for some people, and there are a great many people who live long and happily who take very little if any exercise. It is undoubtedly a good general health rule, but the scientific background for it is extremely vague compared with the fact, for instance, that vaccination prevents smallpox.

Then, cleanliness—"Full bath more than once a week." What health condition will that promote? what disease will it prevent? how will it prolong life? The cold shower—does it prevent colds by "hardening the skin"? Has it really any relationship at all to colds? Certainly, cleanliness is esthetically and socially desirable, and the cold bath is a pleasant, invigorating habit for many people, but how do these compare as facts in contrast to the certainty with which vitamin D will prevent rickets, or to the assurance with which we can guarantee protection against diphtheria with toxin-antitoxin or toxoid? How important is it to "Brush your teeth twice a day" in order to prevent dental caries, as compared with the significance of an adequate supply

of calcium and vitamins A and C in the diet? Presumably, we also have near facts in the immunization and related fields, such as the Calmette vaccine for tuberculosis, the use of convalescent serum in the treatment of poliomyelitis, etc.

Numerous other examples might be cited. Yet it remains that these near facts are appealing, and convincing. In general, we all feel that their promulgation does some good and little if any harm. We feel that most of them are in the right direction though they need verification, and subsequent experience may slightly or extensively modify our views. Here again, of course, we suffer from the necessity of health education being direct, simple, and dogmatic.

CURRENT APPRAISAL DESIRABLE

It may not be inappropriate to suggest the advisability of creating in this organization, and in this section, a committee or other piece of machinery for a comprehensive and continuing review of all of the data that we find appealing and apparently useful in health education. This would mean a careful analysis of the multitude of statements that appear with official or other reliable endorsement. It should also include statements that appear through the spurious channels of quackery and through misleading commercial exploitation. Such an appraisal would lead perhaps to a classification that would be subject to appropriate publicity, as well as to periodic revision. The objective of such a program would be the allocation of facts and their more doubtful relatives into certain groups, on a basis of soundness, of importance, and of timeliness. Of course, importance and timeliness are largely influenced by local conditions and the circumstances of local application. As to soundness, it is believed that these data would almost all, if not all, fall into one of the following groups.

I. Assured Health Facts:
   - A. Those universally and practically applicable
   - B. Those theoretically sound but limited in application because of the imperfections in available methods or for other reasons

II. Near Facts:
   - A. Those about which there is a growing certainty, though as yet no absolute scientific assurance
   - B. Those once generally accepted but about which there is an increasing element of doubt

III. Assured Health Fallacies

A study and classification of this type should furnish a valuable guide to health officers, medical societies, and especially teachers, lay health educators and those social workers and social agencies now so

vitally related to the proper and effective capitalization of verified health data. This suggestion is submitted for the consideration of the section.

A BALANCED VIEW

Finally, if we are to be assured of the continued sympathy and support of our public—the recipients of our health educational efforts—it is important to maintain a sane and balanced attitude. We do not need to accept the extreme individualism and pessimism of Hutchison, and other critics of current health educational effort, in order to take advantage of certain constructive points which these critics emphasize. Let us not present health as a matter exclusively of rules and regulations. Let us not present it as something almost impossible of attainment. Let us feature health rather than disease, so far as that is reasonable. Let us not exclusively preach health for health's sake, but remember that health after all is a means and not an end, and is to be striven for, or at any rate respected, as a basis for growth, character, service, and happiness. In influencing those whom we instruct, let us endeavor to avoid the creation of self-conscious, fear ridden, health prigs, who go by rote and timidly about their daily tasks, with germ-catching respirator and antiseptic mouth wash ever at hand. Let us rather aim at the development of health informed, intelligent, and courageous adventurers in life.

Recent Child Welfare Measures in Spain

THE Government of Catalonia, Spain, decided to send 4 teachers to England, Austria, and Belgium for a 3-month study of kindergartens in those countries. It intends to establish kindergartens and day centers for children of school age whose parents are employed outside of their homes.

Education of defective children is receiving a great amount of attention in Spain. The Institute of Mental Education, a private organization interested in the education of retarded children, has sent an appeal to all members of the National Legislature of Spain, asking them to make satisfactory provision for the education of mentally defective children. At the same time the Spanish League for School Hygiene decided to present to the Minister of Public Instruction a memorandum on the essential points of school hygiene, which, in the opinion of the League, should be included in the public education law that is expected to be enacted before long.—*Maternità ed Infanzia*, Rome, Nov., 1931, p. 1212.

Incidence of Tuberculosis in the Industrial Population*

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FOR a long time, it has been realized by those who have studied the tuberculosis problem that the disease is not uniformly distributed in the population as a cause of sickness and of death, but that it is concentrated in certain stratums and groups. In fact, the campaign to control the disease is more and more directing its attention to these classes and groups. Common observation and everyday experience have shown that tuberculosis is much more prevalent in the industrial population of the country than in the agricultural, the commercial, or in the professional trades. It is the purpose of this paper to point out certain variations in the tuberculosis death rate in the various elements which compose the industrial population. This should prove to be an important aid to the movement against tuberculosis, as it will show where the disease takes the heaviest toll of life, and where it is less prevalent. Such knowledge should make it possible to economize effort and to concentrate resources where they will do the most good.

By the industrial population I mean that large section of the people who live, for the most part, in the cities and towns, and who draw their support from employment in the industries of the country. They are, almost altogether, wage earners and their dependents, including women and children. I use this term "wage earners," knowing well its limitations, to identify the group I shall discuss with that large number of people who are insured in the industrial insurance companies of the country. I might have entitled this paper with more propriety, "The Incidence of Tuberculosis among Those Insured in the Industrial Department of the Metropolitan Life Insurance Company." The advantages gained by using this material are many. It covers a period of 20 years; relates to a population extending over the states and provinces of the United States and Canada; and includes millions of negroes as well as white persons—virtually all city dwellers who live on wages.

* Read at a Joint Session of the Vital Statistics and Epidemiology Sections of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 16, 1931.

Tuberculosis is primarily a disease of the working classes of the country. In 1930, for example, the death rate from all forms of tuberculous disease, among the industrial policy holders of the Metropolitan, was 81.3 per 100,000. In contrast, the death rate for the ordinary policy holders for that year was only 48.7 per 100,000.

These ordinary policy holders are persons who carry insurance ranging from a minimum of $1,000 up to hundreds of thousands of dollars. In the Metropolitan, a great many of the ordinary policy holders carry industrial insurance also. The ordinary department death rate for tuberculosis would be lower still if these were excluded. For example, among those who carry insurance in policies for $5,000 or more (among whom very few carry industrial insurance), the rate was only 17 per 100,000; and among the many employees of the company the rate was 40 per 100,000. It is clear, therefore, that the two main classes of the population are sufficiently far apart in their tuberculosis death rate to show how important is the industrial factor.

We may still further drive home this contrast by recording the fact that the death rate from tuberculosis in the general population of the U. S. Registration Area for the last year available, 1929, was 76 per 100,000 of population, as compared with 87 for wage earners and their dependents. But this figure (76) includes deaths from tuberculosis in the industrial population, as well as in all of the rest. If it were possible (which unfortunately it is not) to obtain the death rate from tuberculosis for the entire population, outside of the industrial class, the rate would be considerably lower than 76. A closer approximation, perhaps, to the tuberculosis death rate of the non-industrial population is the rate for 1929 for the rural area of the United States. That death rate was 74.7 per 100,000,* but even this figure is much higher than the true rate for actual, permanent residents of the rural districts, because it includes that large number of deaths of city residents who went to rural communities in search of health, and died there either in sanatoriums, hospitals, or in private homes.

There can be no question, in view of these figures, of the heavy concentration of tuberculosis as a cause of death in the urban industrial group of the population. Every refinement we could make, which would separate out those who work for salary, or on farms, from those who work for wages in industrial establishments, would make the distinction all the greater. I do not for a moment suggest that tuberculosis is not an important factor in the mortality of the farming population, or that it does not strike down others than the industrial workers in cities; but it does this more infrequently.

* When general population death rates for 1930 become available a still lower rate will be shown, and a greater contrast with the 1930 rate for the industrial policy holders, 81.3.

TABLE I

DEATH RATES PER 100,000 FROM TUBERCULOSIS—ALL FORMS. BY RACE, SEX AND AGE PERIODS. METROPOLITAN LIFE INSURANCE COMPANY, WEEKLY PREMIUM-PAYING INDUSTRIAL BUSINESS. 1911 TO 1930

Tuberculosis—All Forms

Year	One and Over	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74
White Males											
1930	68.0	21.7	8.6	7.9	34.3	80.2	100.6	141.0	177.2	172.2	151.2
1929	73.1	25.6	9.0	7.2	38.3	81.4	120.8	153.9	183.6	167.8	159.1
1927	77.9	29.7	10.0	9.2	44.2	85.4	129.9	167.4	191.0	174.9	153.1
1925	84.3	29.1	9.5	11.4	53.7	103.0	135.6	187.1	204.0	181.8	179.9
1923	97.9	37.2	13.6	11.1	52.9	130.3	169.3	202.5	225.5	206.7	201.7
1921	99.5	35.8	15.2	14.6	62.5	142.8	160.2	207.4	215.5	203.9	192.9
1919	145.2	57.8	19.0	17.4	90.0	153.9	240.4	352.4	353.1	271.2	242.5
1917	194.3	71.2	23.7	20.1	106.7	211.5	344.1	488.7	461.6	360.9	282.6
1915	201.1	68.7	28.0	15.8	91.7	218.8	359.4	517.6	456.7	356.4	262.9
1913	218.2	80.5	23.8	19.9	113.0	252.9	404.3	542.5	473.5	366.1	256.2
1911	230.8	75.6	27.8	21.4	115.9	288.6	424.1	606.1	455.5	392.8	303.6
White Females											
1930	57.1	23.2	8.7	14.1	69.5	108.6	90.7	66.3	57.1	66.7	72.4
1929	63.0	28.0	8.1	14.4	70.8	130.9	105.3	71.6	61.0	66.3	81.2
1927	70.9	27.8	10.4	15.8	93.3	141.7	118.5	79.6	67.7	69.2	82.8
1925	76.7	30.3	12.5	18.1	92.9	155.4	130.3	92.7	70.9	74.7	81.1
1923	88.2	31.3	11.8	24.4	107.4	167.4	144.7	111.3	91.9	81.2	96.3
1921	95.2	36.8	14.8	28.4	118.9	186.9	151.8	118.6	90.9	87.9	106.2
1919	125.2	54.3	22.2	35.6	145.8	228.4	214.3	162.7	121.1	115.4	116.2
1917	135.0	69.4	24.5	38.8	160.0	238.0	220.0	180.6	134.9	128.7	117.9
1915	141.5	70.7	26.0	37.3	146.4	224.5	234.8	206.5	141.8	140.9	133.9
1913	147.7	88.1	29.8	39.7	144.5	230.0	247.7	214.0	151.0	136.4	154.6
1911	165.4	81.6	35.8	39.1	155.2	263.3	293.6	260.4	161.7	150.7	149.4
Colored Males											
1930	223.8	97.2	51.1	73.3	245.4	351.5	295.1	258.7	275.8	204.4	229.8
1929	226.4	125.0	55.4	65.8	272.1	377.7	288.2	266.5	245.6	200.4	174.0
1927	227.6	129.6	55.7	65.4	273.0	341.5	273.2	290.7	251.5	212.7	191.7
1925	224.9	137.2	43.7	85.3	300.6	334.7	276.5	264.7	242.7	211.4	166.0
1923	242.9	139.2	86.0	76.2	285.3	362.3	314.7	286.3	261.3	204.2	206.1
1921	249.1	139.3	77.0	101.3	293.4	353.2	309.9	295.1	264.3	238.0	272.2
1919	319.7	203.8	102.7	177.7	339.2	435.4	388.9	392.5	351.9	289.4	317.1
1917	414.9	197.4	133.4	136.1	450.0	547.5	527.8	562.8	482.3	350.5	381.3
1915	432.8	217.8	134.0	140.1	389.6	532.8	583.6	608.4	436.2	486.6	357.0
1913	428.6	282.2	134.8	147.1	412.7	592.5	545.7	575.8	494.7	446.7	350.6
1911	422.2	345.5	175.4	151.8	416.2	610.6	548.8	488.6	478.2	465.6	364.4
Colored Females											
1930	213.0	97.7	53.9	123.1	368.7	398.1	301.9	182.4	139.2	113.6	113.9
1929	220.1	126.0	66.2	125.6	383.7	432.0	293.1	194.9	149.0	100.8	84.0
1927	228.4	118.4	49.6	126.5	421.6	433.8	339.6	177.3	124.0	97.2	106.9
1925	228.0	116.0	56.2	154.4	431.4	421.2	301.8	184.5	134.1	116.0	99.5
1923	245.7	107.6	59.3	153.6	444.2	489.7	317.1	214.2	161.6	125.4	105.0
1921	285.8	133.4	74.2	205.1	474.4	622.4	374.6	214.7	178.1	137.0	123.1
1919	328.9	157.6	122.3	240.4	642.2	551.6	404.1	283.9	191.1	173.6	196.5
1917	371.7	231.1	163.7	291.3	660.7	587.5	479.4	332.0	213.8	176.7	189.7
1915	394.2	315.2	145.9	285.4	665.1	638.7	497.3	345.5	271.1	220.1	184.7
1913	363.1	313.0	132.7	243.2	601.5	612.1	443.0	366.2	187.8	159.8	194.3
1911	415.1	269.7	178.9	315.7	643.1	735.8	511.3	379.1	234.4	225.4	173.2

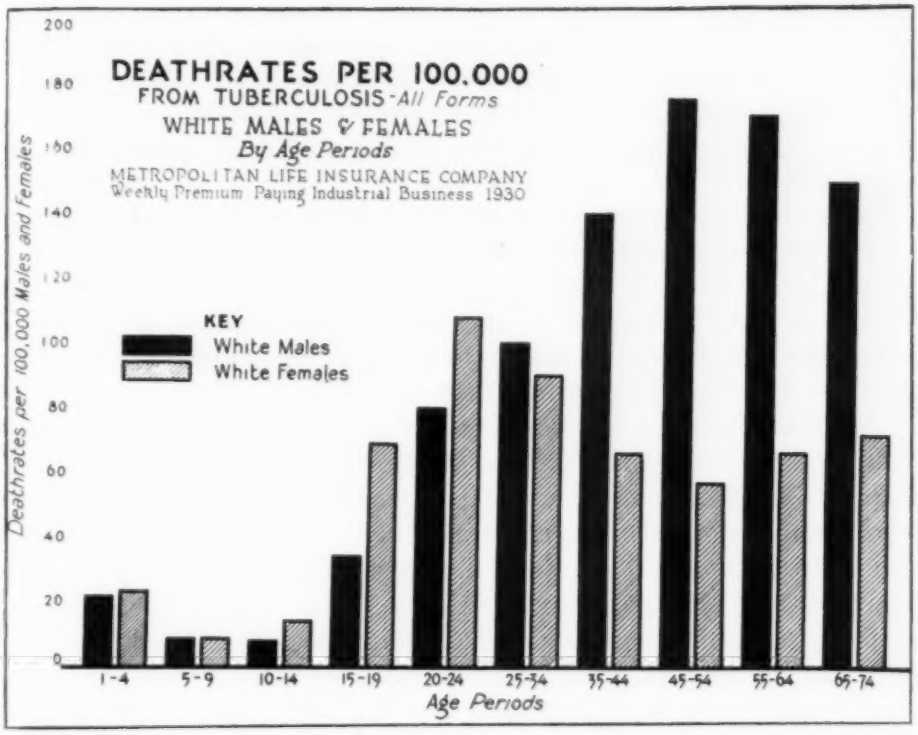
It is safe to say at this time that, by and large, tuberculosis is rapidly becoming a minor cause of death in all but the industrial classes of the population. We shall later call attention to a few apparent exceptions to this statement. But, to illustrate the essential truth of what I am saying, it is only necessary to note the tuberculosis death rates in 1929 of 27 for the State of Utah; 32 for Nebraska; 33 for Iowa; 34 for Wyoming; 35 for North Dakota; and 37 for Idaho and Kansas. In these states, there is a total population of 7,589,190, of whom about two-thirds (63.4 per cent) are rural dwellers, and only a small percentage may be classified as in the industrial population. In these states certainly it may be said that tuberculosis has already become a minor cause of death.

It would be misleading, however, if we did not call attention to the tremendous improvement that has occurred in the incidence of tuberculosis in the industrial population during the last 20 years. In fact, the improvement has been greater in the industrial classes than in the nation as a whole, or in any other major group of the population; for we find, as between 1911 and 1930, a decline in the mortality from tuberculosis of 64 per cent. In other words, for every 10 lives lost on account of tuberculosis in 1911, only 4 were lost in 1930. In the general population, the reduction in 1929, as compared with 1911, was only 52 per cent. Again, I wish it were possible to indicate the decline in other specific population groups, but the only other one for which data are available is a constantly increasing rural area, which between 1910 and 1929 shows a decline of 41 per cent. Obviously, the disease we are discussing was a much more important factor in the life of all elements of the population 20 years ago than it is now; but this applies particularly to the industrial classes. Yet tuberculosis is still the third cause of death in the industrial and the seventh in the general as well as in the rural population.

Within the industrial classification, the disease will be found concentrated primarily among males and among colored persons. Taking the figures for 1930 for insured white persons as our guide, we find no significant difference between the sexes under age 10. From ages 10 to 15, however, the mortality among females is higher by more than 75 per cent; and between 15 and 20 it is twice as high among white females as among males. Between 20 and 25, it is still 35 per cent higher among white females; but after age 25, the rate is uniformly lower among females; and at the age period 45 to 54 it is only one-third as high. Figure I* shows the relative importance of the disease

* The three charts used in this paper are similar in form to those prepared by Miss Jessamine S. Whitney, Statistician, National Tuberculosis Association, for her "Facts and Figures about Tuberculosis." The charts have been brought up to date.

FIGURE I



as a cause of death, in 1930, in the two sexes of the white classification.

Uniformly, the colored people show higher rates than the whites. At some of the younger ages, the rates for the colored are from 5 to 9 times as high as those for the whites, although after age 35 they are less than twice as high for males. Toward old age, the differences become less marked. Table I shows the contrast between white and colored persons on the basis of the 1930 mortality experience in the Metropolitan's industrial department.

With the colored, as with the white, there is substantially no difference under 10 years in the mortality rates of the sexes. Between 10 and 20 the rates for females run from 50 to nearly 70 per cent higher than for males, instead of 100 per cent higher, as they do in the case of the whites. With the colored, it is not until age 35 is reached that the death rate for males exceeds that of females, whereas this condition obtains from age 25 with the whites.

Occupation plays an important part in the incidence of tuberculosis and in its mortality. The very highest rates for the disease are found among those exposed to silica dust. Included here are a large number of workers in ore mills and mines (except coal mines), in the

building industries, and among grinders and buffers, stone workers, pottery workers, employees of foundries and other metal industries, and of the clay and glass industries. Another group having a high death rate from tuberculosis includes those employed in low grade occupations, more particularly common laborers in a variety of industries, longshoremen, porters, freight handlers, watchmen, hucksters, and peddlers.

Certain types of factory work have long been associated with high death rates from tuberculosis, although the mortality among these employees does not reach the figures for those exposed to silica dust. Included among these are the cigar and tobacco workers, shoe factory operatives, those engaged in certain textile occupations, and to a lesser extent workers in the printing trade.

Again, there are a number of occupations, in which there is more or less exposure to organic dust, and which show high mortality from tuberculosis. Among these are barbers and hairdressers, furniture and other wood workers, bakers, textile mill workers, hatters and hat workers (both wool and fur felt), and cigar makers and tobacco workers. The last named occupation has long been recognized as one with an especially high incidence of tuberculosis. In addition to the dust hazard, there is exposure to nicotine and often to general insanitary conditions in the workshops. But it is necessary to point out that in this industry wages are low, and the work attracts many men of poor physique and low resistance.

Another group in which tuberculosis takes a large death toll is laundry workers. This may be due, in part, to the fact that these workers are sometimes exposed to infected material; but the chief factor in their high mortality is probably the conditions of heat and humidity in which they work.

There are other employments in which there is a relatively high incidence of tuberculosis, although they are not associated with any definite industrial risk. Among these are tailors and other clothing workers, cobblers, and slaughter and packing house employees. Clerical workers and bookkeepers also have a higher than average incidence. Here the factors of confinement, poor ventilation, and fatigue, undoubtedly play their part in reducing resistance to infection.

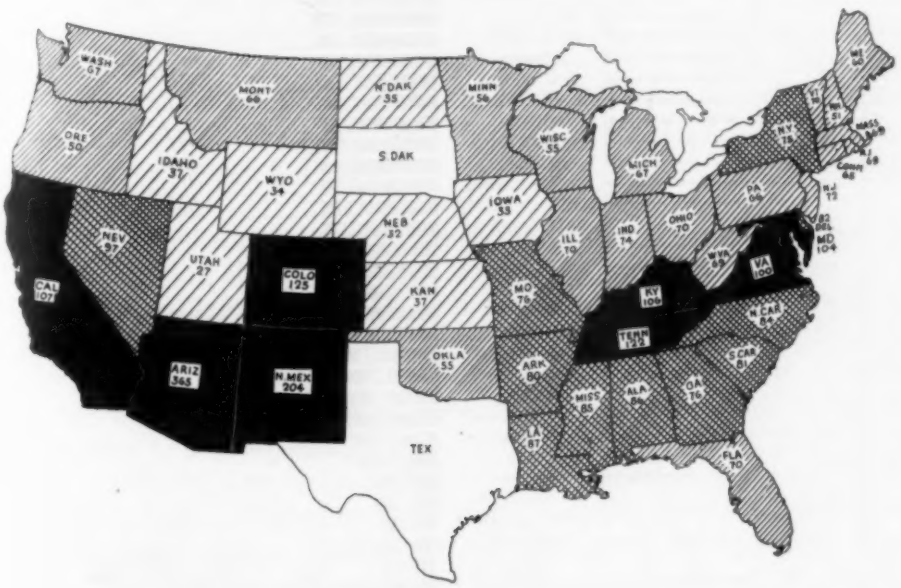
This paper should not close without a brief reference to the geographical aspects of the mortality from tuberculosis. For this purpose I shall have to use data for the general population, even though this paper's title would seem to restrict my discussion to the industrial population. I have already referred to the extremely low mortality in the general population for certain states with predominantly rural,

and non-industrial populations, in order to contrast their low tuberculosis death rates with those of states where the people are more or less concentrated in the cities—and are largely wage earners.

First of all, it will be necessary to disregard the figures for certain states, like California, Colorado, New Mexico, and Arizona, which have very high tuberculosis death rates, solely because thousands of tuberculous people go there every year in the hope that favorable climatic conditions will arrest the disease. Many of these people die each year and thus swell the mortality rates for these states to a point many times in excess of the figure for the permanent residents. There are, however, 4 states where the ravages of tuberculosis are worse than in any others, namely, Tennessee, Kentucky, Maryland, and Virginia. This applies, with the exception of Virginia, to both the white and colored populations. Aside from these states, the following (in addition to the "cure seeker" states) have tuberculosis death rates in excess of the average: Alabama, Arkansas, Delaware, Louisiana, Mississippi, Nevada, North Carolina, and South Carolina.

FIGURE II

DEATHRATES FROM TUBERCULOSIS – ALL FORMS

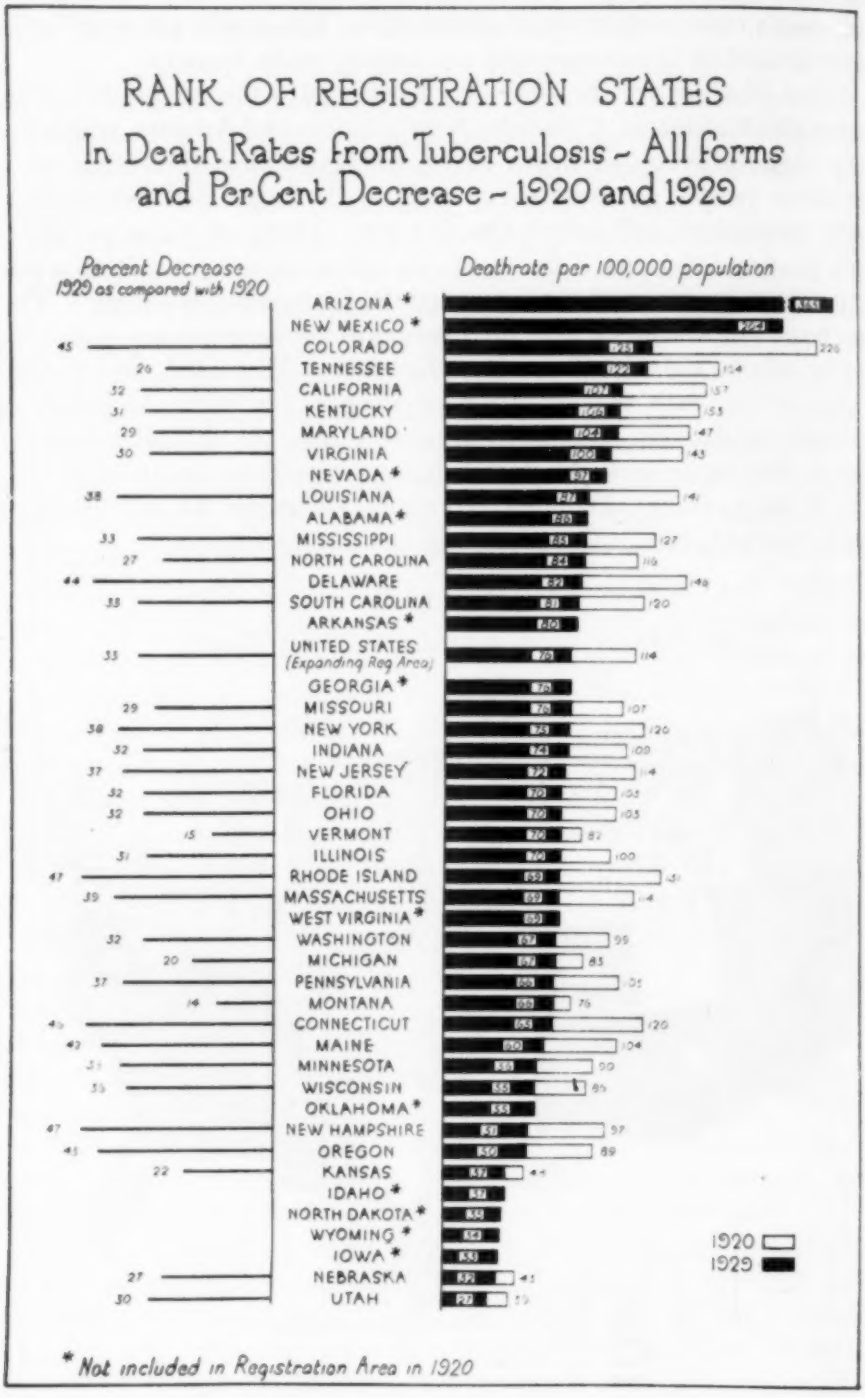


REGISTRATION AREA – 1929

- LESS THAN 50 DEATHS PER 100,000 POPULATION
- 50 TO 75 DEATHS
- 75 TO 100 DEATHS
- 100 DEATHS AND OVER
- NON-REGISTRATION AREA

DEATH RATE UNITED STATES REG AREA – 76 PER 100,000

FIGURE III


RANK OF REGISTRATION STATES
In Death Rates from Tuberculosis – All forms and Per Cent Decrease – 1920 and 1929
Percent Decrease 1929 as compared with 1920
Deathrate per 100,000 population
ARIZONA *
NEW MEXICO *
COLORADO 45
TENNESSEE 26
CALIFORNIA 32
KENTUCKY 31
MARYLAND 29
VIRGINIA 30
NEVADA *
LOUISIANA 38
ALABAMA *
MISSISSIPPI 33
NORTH CAROLINA 27
DELAWARE 44
SOUTH CAROLINA 33
ARKANSAS *
UNITED STATES (Expanding Reg Area) 33
GEORGIA *
MISSOURI 29
NEW YORK 38
INDIANA 32
NEW JERSEY 37
FLORIDA 32
OHIO 32
VERMONT 15
ILLINOIS 31
RHODE ISLAND 47
MASSACHUSETTS 39
WEST VIRGINIA *
WASHINGTON 32
MICHIGAN 20
PENNSYLVANIA 37
MONTANA 14
CONNECTICUT 43
MAINE 42
MINNESOTA 31
WISCONSIN 35
OKLAHOMA *
NEW HAMPSHIRE 47
OREGON 41
KANSAS 22
IDAHO *
NORTH DAKOTA *
WYOMING *
IOWA *
NEBRASKA 27
UTAH 30
1920
1929
* Not included in Registration Area in 1920

Figures II and III show graphically the tuberculosis mortality rates in the several states, in 1929, together with the per cent decline in that year, as compared with 1920 for each state. The map shows the 8 "black spots," states in which the tuberculosis death rate in 1929 ranged from 100 per 100,000 up. As noted previously, the high mortality in Arizona, New Mexico, Colorado, and California is due to deaths of non-residents, and the most serious situation prevails in Tennessee, Kentucky, Maryland, and Virginia. In the last named, the tuberculosis death rate among the white population is not far from the average figure for whites in the United States. Negroes, however, constitute 27 per cent of Virginia's population; and their excessive mortality from tuberculosis raises the death rate for the state to one of the highest figures in the entire country. In Maryland, too, the problem is largely with the negroes, although the mortality from tuberculosis among the whites is also above the average.

If it were possible to obtain resident death rates for tuberculosis for each of the states the shadings in the map would be changed in several instances. I strongly suspect, for example, that the figures for Nevada and North Carolina would be materially lower if deaths of non-residents were excluded.

In Figure III, attention is directed in particular to the per cent declines for the several states. It is encouraging to note that no state fails to show a lower tuberculosis death rate in 1929 than in 1920; but one is immediately impressed with the fact that for each of the 4 states where the situation is the gravest, the drop in the death rate has been less than the average decrease in the United States (expanding registration area).

Large cities whose tuberculosis mortality in 1929 was in excess of the average for all cities in the registration states, considered as a group, are: Albany, Atlanta, Baltimore, Birmingham, Boston, Buffalo, Chattanooga, Cincinnati (very high), Cleveland, Columbus, Denver (due entirely to tubercular transients from other states), Detroit, Duluth, El Paso (for the same reason as Denver), Fall River, Houston, Indianapolis, Jacksonville, Kansas City, Kansas, Kansas City, Missouri, Knoxville, Los Angeles (for the same reason as Denver), Memphis (very high), Nashville (very high), Newark, New Bedford, New Orleans (very high), Manhattan and Richmond Boroughs of New York City, Norfolk, Philadelphia, Richmond, San Diego, St. Louis, San Antonio (very high—probably from non-resident deaths), San Francisco, Scranton, Toledo, Trenton, Washington (due to an extremely high rate among negroes—the mortality is not high among whites), and Worcester.

I have, also, comparable data to show the relative mortality from tuberculosis among the insured Canadian wage earning population, as compared with the death rate in the same group in the United States. The figures for Canada are based upon the mortality experience of about 1¼ millions of industrial policy holders of the Metropolitan Life Insurance Company. They relate to a period of 6 years.

TABLE II

DEATH RATES PER 100,000 FROM TUBERCULOSIS (ALL FORMS) AMONG INDUSTRIAL POLICY HOLDERS IN THE UNITED STATES AND CANADA COMPARED

Year	Death Rates per 100,000			Per cent Excess Canada over United States (White)
	United States		Canada (Total Persons)	
	Total Persons	White		
1930	79.7	59.0	97.3	64.9
1929	86.2	64.9	96.8	49.2
1928	89.8	68.4	94.3	37.9
1927	93.0	71.7	100.9	40.7
1926	98.8	77.6	102.5	32.1
1925	97.7	78.4	104.1	32.8

It will be seen, first of all, that the tuberculosis death rate runs uniformly higher in Canada. Furthermore, the decline has been small in recent years, by no means matching the improvement in the United States. Even when we include the mortality among almost 2½ millions of negro policy holders (as we do in the first column of this table), the Canadian death rate exceeds that for the United States; and it must be borne in mind that the tuberculosis mortality rate for negroes runs about three and one-half times that for the whites. As the Metropolitan has comparatively no negroes at risk in Canada, the really significant comparison is that with the insured whites in the United States. There is a wide gap between the Canadian and United States figures. As a matter of fact, with the slow decline in Canada and the abrupt drop in the United States the excess in the Canadian tuberculosis death rate is becoming greater every year. These figures, it must be remembered, relate almost exclusively to city dwellers. Canada's relatively unfavorable record is due entirely to the very high death rates in the industrial populations of the *cities* in Quebec, Nova Scotia, and New Brunswick. For the remaining five provinces, the mortality from this disease is well below the average for white wage earners in the United States.

On what elements of the population, then, should the attack on tuberculosis be concentrated from now on? First of all, upon the wage

earners in American and Canadian industries, and their dependents. In this group, despite the splendid progress that has been made, tuberculosis still ranks third among the causes of death. Thus, where the greatest progress has been made lies a great opportunity for further progress. Within this wage earning element, the concentration should be primarily on males, except between the ages of 10 and 25, where the mortality among females runs from 14 per cent to more than 100 per cent higher. Second, upon the negroes, both in the industrial and general population, where the reduction in the mortality rate has by no means kept pace with that among the whites—more especially within the last 10 years. Here probably lies the greatest opportunity of all, especially in the age groups under 25, where the negro death rate exceeds the white by from four- to almost ten-fold. Third (and this lies within the field of the industrial hygienist), among those engaged in the several occupations I have mentioned—more particularly among those exposed to silica dust. Fourth, in the general population, both white and colored, of Tennessee and Kentucky, and to a lesser extent in other states, mostly in the South, where the tuberculosis death rate runs above the average; also among the populations of over 30 cities. Fifth, among industrial wage workers and their dependents in the cities of the Canadian provinces of Quebec, Nova Scotia, and New Brunswick.

There is every reason to believe that if the health officers and health agencies of the United States and Canada would concentrate their efforts on these groups of the population, a very definite reduction in both cases and deaths would result. Up to the present time, even lacking such particular concentration of effort, the death rate has declined each year among the industrial population. It should be possible, without undue expenditures of money, to increase the rate of decline. The important thing to do is to concentrate the energy and intelligence of the medical and public health services of the communities along the lines I have indicated. The immediate goal of the tuberculosis movement should be to accomplish for the industrial population what has apparently been brought to pass for those who are somewhat more advantageously placed socially and economically. This can and will be done.

NOTE: Other papers from the symposium on tuberculosis will appear in subsequent issues of the JOURNAL.

What Is Health News?*

GEORGE F. WRIGHT

Editor, Montreal Star, Montreal, Canada

THE putting forward of such a question as "What is Health News?" opens up a far wider range than would appear at first, for I take it that it is not only a question of what is or is not health news, but how such news can be most attractively and most persuasively transmitted from its source to the general public. That is to say, it is not only a question of health news in itself but of the vehicle, and the machinery of transmission as well. How can health news be presented in its most attractive form so that, in the language of the stage, those who present it will be able to "get it across the footlights"?

First, I think it is essential, in so far as the newspapers are concerned, that the copy submitted to them should be arranged and written by a newspaper man, that is, one who is skilled in the craft of journalism. I know that there is a very prevalent opinion that anyone can write stories for the newspapers and that anyone with ordinary common sense can edit a newspaper. I have not occupied the editorial chair for several years without having this forcibly thrust upon me many times. Scarcely a day passes but some male or female applicant for a position, plus salary—always plus salary—approaches me with a request for employment. When I pose to them the obvious question, "Have you had any experience in newspaper work?" they almost invariably reply, "No, but I have always felt that I would like to write for the newspapers and I once wrote a letter to the editor that was printed." Sometimes they vary this by saying they used to write for the school magazine, or they have had friends, or relatives who have been employed on newspapers at various times.

It has often struck me that these same people would never think of going to a doctor and saying that they have always been interested in operations for appendicitis or tracheotomy, and although they had no experience in surgery and no knowledge of anatomy they were simply burning to hold scalpel and forceps in their hands. Nor would they

* Read before the Public Health Education Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931.

go to an engineer and express their admiration of the beauty of a steel skeleton skyscraper and suggest that, as they had walked past so many of these buildings and looked with envy on them so often, they might be employed to erect one. I do not believe that doctors, lawyers, engineers, dentists, or other professional men are so plagued; but I am convinced that there is a very widespread belief that the newspaper craft can be learned overnight, and that the will to succeed is more than half the battle.

May I, before this gathering of men of brains and culture, do my bit toward dissipating this error. The newspaper profession requires just as much brains, and just as much training, and just as great native gifts, and just as much genius, as any other profession. I know that the universities neglect this field of training, but that does not imply that the years of training should not be long and arduous. Good newspapermen, like great poets, may be born and not made, but they must pass through a long course in human experience and undergo an exhaustive training before they are competent to be entered as journeymen in this great craft. If, in the process of apprenticeship, they have starved and suffered from cold and had no place to lay their heads and been buffeted by the world, but have won through, they are all the better for the process of sublimation.

May I, therefore, make my first point—that the organization, or individual, the association, the company, or the professor, who wants to get his health news across, should engage a man trained in the art of journalism for that work. The journalist will not only prepare the material in the most suitable form for publication, but if he has had proper training he will know where to place his output and how to adapt its form to the individual requirements of the various newspapers, or the idiosyncracies of different editors.

If I may venture a little further, I might in all humbleness advise the newspaper man who has the preparation of that copy in hand to make his stories short and divide them into paragraphs of different sizes. The make-up man of a newspaper often finds it necessary at a moment's notice to discover a readable paragraph, or even a short sentence, which will fit into an obstinate corner. If such matter is available, it stands a good chance of being used, even if, on its own intrinsic merits, it might not have readily passed a censorious editor.

Next, with regard to the content of the news, medical men as a whole are loath to give publicity to their achievements, their discoveries and their researches. It is not so much, as a rule, that they shun the publicity, but that they fear their findings, which are to them something so intimate and personal as to become almost sacred, may be

distorted in the presentation. They charge the newspaper with sensationalism and some mysterious quality which they call yellow journalism, if it endeavors to present a dull, abstruse, scientific subject in popular fashion. They seem to have a rooted objection to the presentation of their researches and discoveries in attractive form.

These same men, in telling clubroom stories to one another, would not hesitate to dress the facts of the story up so that they could hold the interest of those who heard them. A man who tells a story which commands general approval, and wins for the teller a reputation as a good fellow, is the man who presents his story to his listeners in a fashion that rivets their attention, excites their interest, and moves them to tears or laughter. This is exactly what happens when facts are presented to the newspaper man. He sifts the mass of indigestible facts and pounces upon the one that contains real human interest, and dresses his story up to make it readable. He is instantly accused of having given undue prominence to what was a minor fact of the great discovery and he is told that it should be presented in a methodical and orderly fashion which is immeasurably dull and would never induce anyone to read it.

If public health news is to be read by the general public, it must be presented in attractive and readable form, even at the expense of treading on the corns of the erudite professors who are primarily responsible for the sources from which the news originated. I do not mean to say for a moment that the newspaper should sacrifice accuracy and truth. A strict adherence to fact is the one motto which the editor is always placing before his staff. Contrary to the general belief, he does not incite them to such high imaginative flights that they soar far beyond the realms of truth and reality. He knows they have the imagination and he urges them in season and out of season to keep their feet on the ground of realism and truth, when their wings are itching to be spread in an upward and forward flight. But, conforming to the truth and the facts of the case, the newspaper article should be attractive in presentation.

Remember that the standard of intelligence of the newspaper reader is not the standard of intelligence of the university faculties. Out of every 1,000 readers of a newspaper 50 per cent would not gain passmarks in the simplest general knowledge test, so that the newspaper which persistently printed scientific and erudite articles would get a reputation for being "highbrow" which would damn its circulation.

So far as public health news is concerned, there are certain things to be remembered. The people as a whole are receptive to the idea of

health improvements. They are "sold" on the idea of public health, and the thing the newspaper has to do is to show the practical and definite steps that the readers must individually take to bring about a general improvement in public health. That is, readers like to see statistics showing that the death rate is being lowered year after year, and that some of the dread diseases are being conquered, but that type of reading alone will not advance the cause of public health one iota. What the reader has to do is to get into his brain the necessity of carrying out certain simple rules of living. The newspaper must impress this day after day, not openly with the broad sword, but with the finer thrust and parry of the rapier. The direct attack is not always the most effective. To tell people they are dirty and unhealthy will not accomplish the end of the public health teacher half so effectively as to inculcate into the individual the need of more soap and less foul air. The appeal may seem to be to the masses, but its reception is really felt individually.

Constant reiteration of plain truths is of value, but if that plain truth can be garnished and served up in a hundred different forms, as a clever chef might serve the humble potato, the work of the public health officer will be immeasurably lightened.

In conclusion, let me say that editors as a rule are willing to support efforts toward improvement of the public health by giving freely of their advice, their time, and the space in their newspapers. I would be ashamed to measure the prestige which a newspaper receives by the part it plays in fights against the common enemies, dirt and disease. I know that I am very proud to have been associated, in a very humble way, with the fight the *Montreal Star* has made for pure milk and for better health conditions, indeed prouder of this than of any other accomplishment as an editor.

Newspapers want your coöperation. It is your responsibility to obtain that coöperation, each in his own community.

THERE has never been any inflation of public health service and it is, therefore, incapable of deflation. Furthermore, public health work has paid its way, being in fact one of the greatest investment services of our people. What we have put into public health has been paid back to the public many times over in reduced sickness and lower medical costs, and in the salvage of valuable lives. Fortunately, throughout the year and, in fact, throughout the period of economic disturbance through which we are now going, the public health has held up beautifully, showing the effectiveness of our health organizations. They may be relied upon even in periods of stress to do their work well."—Louis I. Dublin, Ph.D.

EDITORIAL SECTION

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LUEBECK DISASTER

IT will be remembered that after the administration of Calmette vaccine for tuberculosis at Luebeck, Germany, a large number of the children became ill, the final result being that 68 of 76 children died of tuberculosis.

The work was under the charge of Professor George Deycke. On October 12, 1931, he and those who had assisted him were put on trial with the result that he was found guilty and sentenced to 2 years in prison while Professor Altstaedt was found guilty of homicide and sentenced to 15 months in prison.

Needless to say the affair caused intense distress throughout the world. Professor Calmette sent cultures of the same batch of vaccine to South American and other places, all of which were used without any ill effects. Altogether upward of a million children have been treated with this vaccine without any ill effects as far as has been observed.

It is perhaps needless to add that during the 4 months of this trial every available bit of evidence has been brought forward. The scientific side has been thoroughly discussed. Many scientific men have tested this vaccine on animals and on a number of children. In New York City the Department of Health has used it apparently with excellent results and certainly no ill effects. Two points which have arisen are: (1) that an error was made and virulent tubercle bacilli

were used instead of the attenuated vaccine; (2) that a different culture made from that advised by Professor Calmette was employed and that the vaccine reverted to the virulent type. The conclusion arrived at is that the hospital laboratory was not fitted for such work.

Cultures of tubercle bacilli and Calmette's vaccine were made side by side and it appears that one was accidentally substituted for the other and that these poor children received inoculations with virulent human cultures.

This conclusion seems justified in view of the large number of children inoculated in various countries with Calmette's vaccine without ill effect.

One cannot but feel the utmost sympathy with Professor Deycke and his assistants. Apparently at the beginning he became somewhat hysterical and destroyed some of the evidence. Later he showed himself to be a man as well as a scientist and declared that whatever mistake had been made he was responsible for it. The sympathy of all scientific men goes out to him. Sanitarians and laboratory men will be glad to know that the Calmette vaccine is not dangerous and that this disaster was due to an accident entirely unconnected with the vaccine dose.

THE MEDICAL PROFESSION AND PUBLIC HEALTH

THOUGH some of our national bodies are cognizant of the bad effects of the general depression on health work through the discontinuance of activities and the resulting dropping of health workers, medical and other, and though there has been widespread fear of the malnutrition which would almost certainly result, comparatively few people, we believe, have considered the plight of physicians in the present emergency. Not only are they in less demand, since people consult them only when necessary, but the payment of fees has been deplorably cut, and the doctors find themselves hard put to it economically. There has been a large increase in the number of indigent ill and the doctors are expected to carry these, as, we are glad to say, they always have done in the past. At the same time, there has been no let-up in the demands made upon them by legislative bodies, taxation authorities, courts of justice, and similar bodies. The public is rapidly becoming educated to demand the best services, the use of modern methods of diagnosis, involving expensive apparatus, and easy access to fully equipped hospitals.

The education of the public is, in our opinion, all to the good. We

have welcomed the foundations, and recognize the good work which they have done. It is, however, equally sure that these various organizations, many of which have millions at their disposal, have to a certain degree made the lot of the practicing physician hard. Numerous organizations, some under medical control, but probably a greater number under lay control, have been aggressively assuming the direction of medical service along a number of lines. Some of this, like the education of the public, is all right. The average doctor is not a good business man. The calls on him are to heal the sick and relieve suffering. Except among a comparatively favored few located in large cities, the doctor does not enjoy a large income and his time is never at his disposal, owing to the many calls made upon him throughout the twenty-four hours of the day.

It can hardly be denied that there has been a growing unrest in the profession. State medicine has been talked about, and a certain number of the profession have felt that we have already gone too far toward it. State medicine is a bogey to American physicians and properly so, we believe. Just where to draw the line between State care and care by the family physician has been a puzzle for many years, and many believe that there is too much trespassing upon the field of the private practitioner, or, as a recent writer[1] has put it, "the State is becoming too paternalistic in health matters. . . . The family physician is the most important member of society and upon whom there rests the responsibility for protection of the health of the public more than upon any other factor in public health."

Recently the State Medical Society of Michigan[2] adopted a resolution instructing the President to appoint a committee to study the problems outlined, which they believe require immediate and critical attention. Among the reasons brought forward as producing the present emergency, are mentioned public health service operations, the Medical Corps of the Army and Navy, the Veteran's Bureau, narcotic and child health bureaus, federal and state laws, licensure laws, decisions of the Supreme Court, etc. They recognize without question the right and the duty of the government to impose reasonable requirements upon doctors and medical practice. They list also nineteen activities which have interfered with the doctor and medical practice, including the foundations, some of which are active in promoting county health units, state universities with hospitals and medical service, state tuberculosis sanatoriums, crippled children's work and hospitals, city health and school departments, welfare departments, etc., in addition to medical services conducted by industrial corporations, clinics, private and endowed hospitals, etc.

The problems confronting the medical profession, many of which have been voiced by the Michigan Society, are real and urgent. The current medical journals have recently carried a number of articles on the general subject, the particulars of which are given in the resolution mentioned.

In various states and cities, official commissions have been appointed to study legislation concerning general health, child welfare, tuberculosis, etc. Unofficial health organizations have performed most useful educational service. Many state medical societies have been considering the question of public relations, but coöperation so far has not been brought about to the degree which could be desired. "If we do not take the leadership, government will have to do it because public sentiment, when aroused, is quite likely to find ways of getting what it needs. Medicine is today in a strategic position. It can take leadership in the solution of problems. . . . Its public position on public health questions will determine its future influence. Health organizations get their chief incentive in medicine's failure in meeting present-day health problems."

Medicine has advanced tremendously—so has public opinion. We are going through a stage of transition. The doctor has possibly been too much engrossed in healing the disease and forgetting the patient, as well as the social problems involved in medical practice. The profession has become overspecialized, and the average doctor has been led to feel that some of the specialties—mental hygiene, for example—are beyond the ken of the average man. Certainly it involves knowledge and experience which the average practitioner does not have, and it is hard to see where he is going to obtain either, and at the same time make a living. Other problems, such as those presented by venereal diseases, are pretty well understood by the average practitioner, but involve tremendous legal and social obligations and responsibility. The clergy, and other well meaning but medically ignorant people, object to prophylaxis on moral grounds, apparently forgetting the innocent sufferer. The physician is a health officer, and as a rule, recognizes his duties very much more clearly than the social organizations which have interested themselves in the matter. Many believe with reason that we are in a state of transition which carries with it necessary problems, and some upset. The medical profession has shown the need of all of the services given by lay organizations, including vital statistics, public health engineering, etc. It has failed to recognize the differences between the practice of curative medicine and prevention, and also the fact that public health work constitutes a special calling, and requires special training. If the medical profession

is to serve itself and guard the honorable position which it holds, and has held at least since the Middle Ages, it must still lead in health matters, and be even more ready than in the past to coöperate in public affairs.

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THE TWO-YEAR PERIODICITY OF MEASLES

THE Central Public Health Committee of the London County Council forecasts an epidemic of measles in London during the autumn of 1931 and winter of 1932.[1] Measles in epidemic form occurs in that city at intervals of 2 years, beginning late in the autumn and lasting some 6 or 7 months. Since the last epidemic occurred in 1929–1930, the next is expected about this time. About 50,000 children are affected during each outbreak. This periodicity at 2-year intervals has been observed since 1918 in New York City, though experience leads them to expect high prevalence of the disease in the even-numbered years and low prevalence in the uneven.

The year 1931, however, has been an exception to this rule, and the New York authorities are seeking an explanation. For the first 9 months of this year, 26,238 cases have occurred against 22,865 for 1930.[2] In the *Weekly Bulletin* a table for 12 years is given showing without exception the greater prevalence of the disease in even-numbered years, extreme cases being 2,101 for 1927 against 35,008 for 1928. The reasons for the greater prevalence observed for 1931 over that expected, and over that for the uneven-numbered years, are not clear, and the event has upset the calculations of the health authorities.

In London the 2-year periodicity seems to be very well established, and since the epidemics begin late in the autumn of the uneven-numbered years, we may say that most of the epidemics occur in the year following with the even number, which accords entirely with the observations in New York, though the London practice of combining the autumn and winter in this respect makes the comparison a little uncertain.

In London the deaths from measles have shown very gratifying decrease, from 9,538 in 1906–1910, to 3,715 in 1926–1930, the figures for the intervening years, with one exception, showing a steady decrease.

The plan in London is: (1) To make every effort to avoid contraction of the disease until after the 3d or 5th year, since the younger

the child, the more danger there is of serious illness; (2) To secure adequate nursing and medical care; (3) To remember that measles is particularly fatal among undernourished children and those living in bad surroundings. These causes operate in the same way in this country, though we would add to this particular program the avoidance of tuberculosis, since in both white and colored, but especially in the latter, tuberculous infection leads to a very high mortality following measles.

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SURGEON GENERAL HUGH S. CUMMING REAPPOINTED

THE nomination of Surgeon General Hugh S. Cumming of the U. S. Public Health Service to succeed himself was sent to the Senate on January 26 by the President. This is a cause for congratulation to the country and to the members of the Service. Under his administration, the activities and influence of the Service have constantly increased in various fields of endeavor. The recent establishment of the National Institute of Health has been one of the great advances which have taken place.

General Cumming has been Surgeon General during an exceedingly trying time. It is only necessary to recall the epidemics of meningitis, poliomyelitis, psittacosis, the flood conditions on the one hand, and the drought on the other, all of which have raised problems of extreme importance, affecting large areas of this country, and incidentally our relations with other countries with which modern means of transportation have coupled us so closely. All of these emergencies have been met and handled with judgment and efficiency.

Among the many perplexing complications which engage the attention of the authorities in Washington, it is a relief to turn to the work of the U. S. Public Health Service under General Cumming with its smoothness of operation and the accomplishment of worthwhile results of vast importance to health and happiness of our nation.

ASSOCIATION NEWS

DR. PETER H. BRYCE

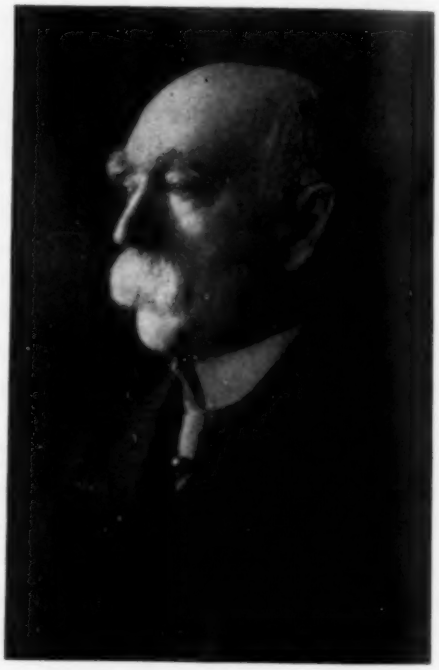
THE medical profession has learned with deep regret of the death on January 15 of Dr. Peter Henderson Bryce, President of the American Public Health Association in 1900, and a member of its Executive Board from 1916 to 1921.

Distinguished alike as a physician and as a man of letters, Dr. Bryce was a product of Brant County, Ontario, having been born at Mount Pleasant on August 17, 1853. His education was received at Upper Canada College and the University of Toronto, from which institution he was graduated as B.A. in 1876. Progressively he acquired the degrees of M.A. (1877), M.B. (1880) and M.D. (1886).

He practised first in Toronto and Guelph, and was later appointed professor of chemistry at the Agricultural College in the latter city.

An outstanding member of the medical profession in Canada, Dr. Bryce had occupied many important positions. He was founder of the Ontario Department of Health, serving as secretary from 1882 to 1904. He was appointed chief medical officer of the Department of the Interior and Indian Affairs in 1904, a position he occupied until his retirement in 1921.

Since his retirement, he had identified himself with many learned societies. For a number of years he was President of the Arts and Letters Club of Ottawa, of which he was one of the early members and staunch supporters, and he also became a member of the Canadian Historical Society.



PETER H. BRYCE, M.D.

The author of several works, including scientific volumes, Dr. Bryce had only recently completed the life of Sir Oliver Mowat, which is expected to perpetuate his memory in the field of Canadian letters.

Dr. Bryce joined the A. P. H. A. in 1883, and was made an Honorary Fellow in 1922.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Dr. John E. Burch, Daytona Beach, Fla., Health Officer

Avon H. Elliot, M.D., Health Department, Wilmington, N. C., County Health Officer

Ernest M. Ewers, M.D., Somerset, Ky., Director, Pulaski County Health Department

Lunsford D. Fricks, M.D., 216 Canadian National Pier, Seattle, Wash., Medical Director, District No. 6, U. S. Public Health Service

Joseph C. Healy, M.D., 1 Market St., Lockport, N. Y., Health Officer

James H. McEachern, M.D., 401 City Hall, Tampa, Fla., City Health Officer

Z. V. Moseley, M.D., Kinston, N. C., County Health Officer

J. W. Roy Norton, M.D., Rocky Mount, N. C., City Health Superintendent

Louis J. Petritz, M.D., City Hall, Venice, Calif., Assistant Health Officer

Van A. Stilley, M.D., Benton, Ky., Assistant Director, Bureau of County Health Work

Dr. James A. Summers, City Hall, N. Little Rock, Ark., City Health Officer

Clarence H. White, M.D., Box 480, Henderson, N. C., Health Officer of Vance County

W. Carter Williams, M.D., Health Department Building, Franklin, Tenn., Director, Williamson County Health Department

Richard F. Yarborough, M.D., Louisburg, N. C., Health Officer of Franklin County

Laboratory Section

Maurice P. Lafleur, M.D., 1112 Route Lafleur-Ducheine, Port-au-Prince, Haiti, Teacher of Hygiene

Lyndon R. Rhodes, 67 Quincy Shore Drive, Atlantic, Mass., Dairy Chemist, White Bros.

Stanley J. Thomas, Ph.D., Lehigh University, Bethlehem, Pa., Professor of Bacteriology

Abdel M. Wahby, D.V.M., Bacteriological Laboratory, Cornell University, Ithaca, N. Y., Research Worker

Herbert C. Ward, 6214 3d Ave., Kenosha, Wis., Director, Biological Laboratory, U. S. Standard Products Co.

D. Evelyn West, Box 1001, Hartford, Conn., Microbiologist, State Department of Health

Public Health Engineering Section

Louva G. Lenert, State Board of Health, Jacksonville, Fla., Chief Engineer; Director, Bureau of Sanitary Engineering

Chris G. Lightcap, R. R. 2, Box 63, Phillipsburg, N. J., Sanitary Engineer

Marvin T. Rowland, Chamber of Commerce, Texarkana, Tex., District Engineer, State Health Department

Industrial Hygiene Section

Paul A. Davis, M.D., 1436 Delia Ave., Akron, O., Assistant Medical Director and Hygienist, Goodyear Hospital and Factory

Max Kummel, M.D., 315 Central Ave., East Newark, N. J., Industrial Physician and Surgeon

Food and Nutrition Section

Harriet I. Albee, 108 Warren St., Concord, N. H., Assistant Chemist and Bacteriologist, State Board of Health

Julian H. Toulouse, Ph.D., 726 Bond Building, Washington, D. C., Director of Laboratory, American Bottlers of Carbonated Beverages

Mr. William J. Warner, 165 Capitol Ave., Hartford, Conn., Dairy and Food Commissioner

Child Hygiene Section

Jozef Lubczynski, M.D., Grochowska 36, Warsaw, Poland, Health Officer (Assoc.)

Dr. Lloyd P. MacHaffie, 162 Clemow Ave., Ottawa, Ont., School Medical Officer

Leonard J. Piccoli, Ph.D., 88 E. 208 St., New York, N. Y., Professor and Head of Department of Materia Medica and Physiology, Fordham University

Public Health Education Section

Herbert F. Hirsche, 90 Livingston St., New Haven, Conn., Executive Secretary, Cancer Control Committee, Department of Health

Mary A. Hodge, M.D., 319 Gittings Ave., Baltimore, Md., Professor of Physiology and Hygiene, Goucher College

J. Alphonse Lapierre, M.D., Ste Anne des Monts, County Gaspe, P. Que., Medical Officer of Health

Epidemiology Section

Anson B. Ingels, 194 Adelaide Ave., Providence, R. I., Epidemiologist, State Public Health Commission

Public Health Nursing Section

Mrs. Anna Van W. Castle, 911 Delaware Ave., Wilmington, Del., Director, Visiting Nurse Association

Letitia E. Lynch, County Health Dept., Santa Barbara, Calif., Supervising Nurse

Emma R. McLeod, 417 George St., New Brunswick, N. J., Public Health Nurse, Director of Visiting Nurses Association

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TRAINING AND PERSONNEL

THE following bill which is before the legislature in the State of Massachusetts will be of news interest to the members of the Association as a development in the field of Personnel.

House Bill 262—An Act providing for Examining and Licensing Local Public Health Officers or Agents. 1932.

Section 1—On and after 1 year from the date of passage of this act no person shall be appointed as local health officer, or as an executive or agent of the board of health of any town or city having a population of 10,000 or more, or as the executive officer or agent of any group of towns having a combined population of 10,000 or more, unless he has been licensed as a health officer by the State Department of Public Health.

Section 2—A license as a health officer shall be issued by the State Department of Public Health to each person who passes an examination in sanitation and public health procedures.

Section 3—The examinations shall be conducted in such manner and at such times as the state department of public health shall determine.

Section 4—This act shall not prevent any local board of health from continuing in office, without examination and license, any health officer or agent who fills such office at the time of passage of this act.

Section 5—A fee of _____ shall be paid to the State Department of Public Health by the applicant for each examination taken for a license as health officer.

This bill is presented by the Massachusetts Civic League with the endorsement of the State Department of Public Health, the Massachusetts Association of Boards of Health, the Schools of Public Health in Massachusetts, and with the support of the many professional workers.

In 1927, the American Public Health Association approved the "Principle of the Licensing of Health Officers Upon the Basis of Their Professional Qualifications." The bill quoted above is certainly in accord with this general principle.

No model bill has yet been developed within the Association, but many leaders in public health administration believe that the time has come for legislative action setting standards for appointments to various positions in the public health field. The Committee on Training and Personnel is at work through its sub-committees in the development of a vigorous program for developing both public support and legislative action looking toward the improvement of tenure for workers now in public health positions and toward the selection of trained individuals for future appointments. Subsequent issues of the JOURNAL will carry reports upon committee activities.

PUBLIC HEALTH ADMINISTRATION

VISUAL RATE CHART

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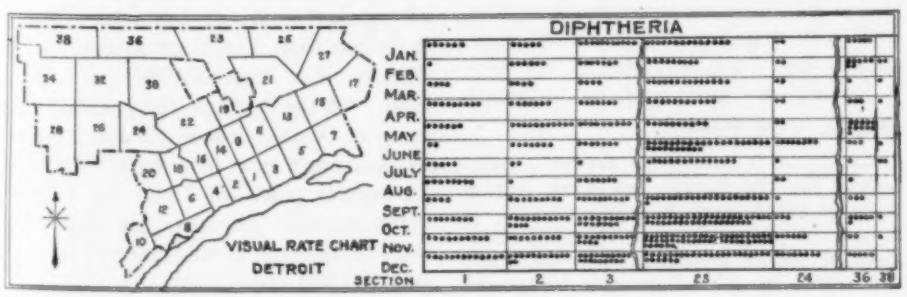
AN epidemiological master chart useful in the graphic presentation of epidemiological data by districts was submitted in a recent article in this section.[1] Although primarily intended for annual rates this chart may readily be adapted for routine or running records. In watching the situation from day to day or from week to week the usual procedure is, of course, to use spot maps showing approximately the location of the case, death, or service. This method has considerable practical merit, but it is very difficult to combine with the spot map graphical information concerning density and character of population, and obviously it is impossible to derive even relative ratios. Many methods have been proposed to get around these difficulties.

The visual rate chart presented herewith (only a fragment of the entire chart is presented in the accompanying illustration) has a certain usefulness in this regard. It may be used in connection with a spot map showing the exact location of the case, or it may be used alone if the general location need not be known closer than the sanitary district. A detailed account of the construction of the chart was presented in the previous article. For practical purposes the idea is essentially that a bar is divided into sections according to the proportion of the population of the various districts. For instance, the width of section one is in the same proportion to the total length of the bar as the population of the section is to the total population. It may be desirable to divide the bar further into time elements. In the illustration months are used for this purpose.

When cases occur, instead of being spotted in the area on the geographical map to which they belong, they are spotted in the appropriate section of the bar chart. The dots and the spaces between need not be exactly of the same size but should be reasonably so. By referring to the illustration it will be seen that it is possible to put 13 dots along the horizontal axis of section 1 while only 5 dots of approximately the same size can be put in section 36. If there are 13 in section 1, and 5 in sec-



tion 36, the rate for the two districts must necessarily be the same (see the month of December). If there are only 6 dots in section 1, with 5 dots in section 36, it is apparent that the rate in section 36 is twice that in section 1 (see January). Again, if the line of dots goes twice across the available space in 36 and only half way in section 1, the ratio is obviously 4 to 1 (see May). It is thus apparent that comparable visual rates are available at any time since the number of cases will be shown in direct proportion to the population exposed.

Such a chart has a definite place in current statistical tabulations where it is important to know not only the number of cases but relative attack rates by districts. Correlation of this information with that provided by the epidemiological master chart is useful in a rapid appreciation of the factors involved in the progress of an epidemic.

Dependent upon the use to which the data are to be put, the chart may be kept by convenient time intervals or may be made cumulative. The principle is essentially the same.

The visual rate chart has proved to be of considerably greater value than the ordinary spot map in that it permits the instantaneous derivation of visual rates without additional laborious bookkeeping and statistical analysis.

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New York Health Center Districts Statistical Reference Handbook—The Committee on Neighborhood Health Development of New York City, of which the Commissioner of Health is chairman, has issued a handbook of statistical reference data which is of value to public health and public welfare administrators as well as to statisticians. The 1930 federal census figures are given for each of 30 health center districts together with population trends covering the past 10 years. Information is presented for each district concerning births, deaths from all causes, infant deaths, tuberculosis deaths, registration of new cases of pulmonary tuberculosis, venereal diseases, and other communicable disease reports, with corresponding rates. School registration has been brought up to date. A section also deals with public health nursing requirements.

The report is designed to furnish a background for the further and more detailed study of health needs in each community as a basis for the sound and orderly development of district programs of public health, and should be an indispensable background to district health officers for the future evaluation of local programs. It is also hoped that the handbook will be useful to the voluntary agencies in helping them to adjust their programs to local needs, and that it may prove of interest to other communities wherever the problem of district health center development is being considered.

It is noteworthy that the Committee on Neighborhood Health Development, which is aiding the Department of Health in the planning of district health centers, has in its membership two representatives from each of the five county medical societies.

The complexity, as well as the diversity, of the problems of the various districts in the city becomes apparent when the data presented are studied. Density of population in the city varies from a little less than 3,000 per square mile to slightly less than 85,000 per square mile. On the average, there are 125,000 cases of communicable diseases reported in an average year in greater New York. In normal years for 15 of the common communicable diseases, the case rates vary in different areas from 895 to 2,550 per 100,000 population.

The general death rate for the city as a whole was 10.7 in the 2-year period 1929–1930. The rate for Manhattan was 13.6; for the Bronx 8.6; for Brooklyn 10.2; and for Queens 8.9. Similarly, for the same period, infant mortality varied. The rate for the city as a whole was 57; for Manhattan 74; for the Bronx 47; for Brooklyn 55; and for Queens 49. But there was even greater diversity in infant mortality in the various health districts, the highest rates occurring in Central Harlem. The statistical data and excellent maps included in this handbook render it an indispensable aid in program planning.

New Haven, Conn.—In this city of 162,658 population, there were 14 cases of diphtheria, with 1 death, an adult, in 1930. There were no cases in the age group under 5 years. Five of the total cases were in institutions, 4 being in an orphan home. One of these cases was a new boy, 2 others had received 3 toxin-antitoxin administrations the previous year, while 1 boy had given a negative Schick reaction on 3 tests. The fifth case in an institution, a nurse, had received 3 inoculations the previous year. During the year there were found 214 carriers, 47 of these being in the age group under 5, and 8 being in the age group over 15. All but 5 were nasal carriers, and only 11 resulted in positive virulence tests. Eighty per cent of the carriers were found by the communicable disease bureau personnel, 15 of the cases occurring among new arrivals seeking school admission.

During the year there were 200 cases of measles with no fatalities. For 4 years it has been the practice of the health department to provide special medical care of cases of measles and whooping cough in their homes if no private physician is in attendance. Relatively few measles cases were hospitalized in this epidemic, and the results of the supervision are noteworthy.

Among the 93 tuberculosis deaths, 69.8 per cent occurred in hospitals or sanatoriums and 78.5 per cent had been hospitalized. Eight-one of the cases were known to the bureau before death. A tuberculosis death rate of 57.2 is recorded. There were 341 new cases reported during the year, 278 having been reported by physicians. Of the 18,811 home visits made by the Visiting Nurse Association, 9,108 were to diagnosed cases, while 2,543 visits were made to post-sanatorium cases. The 349 cases admitted to hospitals and sanatoriums during the year received a total of 69,717 days of care.

At the summer camp, 101 children stayed an average of 65.5 days.—*Annual Report*, New Haven Dept. of Health, 1930.

LABORATORY

INTRADERMAL METHOD OF VIRULENCE TESTING OF CORYNEBACTERIUM DIPHTHERIAE *

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THE procedure of determining the virulence of *Corynebacterium diphtheriae* by means of intradermal injection of pure cultures, as modified by Zingher and Soletsky [1] from Neisser's [2] method, or of mixed cultures as advocated by Havens and Powell,[3] Force and Beattie,[4] and others, has found considerable practical use because of its apparent accuracy, combined with its relative economy and simplicity. It has been adopted as a routine in some laboratories, while in others its use has been limited mainly to epidemiological investigations involving cases or carriers of diphtheria. It is also valuable in the testing of numbers of stock strains of these organisms when knowledge of their toxigenicity is requisite to other studies involving this group of organisms, since it is possible to test satisfactorily from 8 to 12 strains or more on one guinea pig, or 20 to 30 cultures on a large white rabbit, the latter animal being considered by some workers [5] as more sensitive to diphtheria toxin.

In attempting to utilize this method of testing virulence of diphtheria-like organisms, the author has recently observed a complication which seems sufficiently important to be reported, as there appears to be no discussion of it in periodicals commonly available in the English language. It is a point involving the interpretation of the results of intradermal tests of recently isolated cultures of *C. diphtheriae* and is inherent in the principle upon which this method is founded, viz., tissue injury due presumably to the toxigenicity of these organisms.

While testing a number of recently isolated pure cultures incident to another study in progress, using 0.1 c.c. amounts of 24 hour broth cultures of 8 different strains on each of two guinea pigs (Nos. 332 and 333) one of which (No. 332) had been protected 2 hours previously by intraperitoneal injection of 400 units of diphtheria antitoxin, it was noted that the corresponding sites of inoculation of one culture (No. 1177a) developed on both guinea pigs a severe necrosis by the end of the first day. These lesions increased in size from about 1 cm. diameter to approximately 1.5 cm. by the second day, while all sites of injection of other cultures remained distinctly negative on the protected animal and just as clearly positive on the unprotected guinea pig which died sometime during the 2d night after the inoculations were administered. Sloughing of the superficial portion of the skin occurred on pig 332 between the 3d and 4th days.

In common practice, especially when dealing with "field-cultures," such reactions occurring on both the test and the protected animals are likely to be read as negative. Thus Zingher and Soletsky,[1] who originated the idea of using one test guinea pig and one protected guinea pig in this type of virulence testing, say:

> The results of the tests are noted in 24, 48 and 72 hours. Virulent strains produce a definitely circumscribed, local inflammatory lesion,

which shows a superficial necrosis in from 48 to 72 hours. In the control pig the skin remains normal, if the injections have been accurately carried out.

Havens and Powell,[3] who are the first to report the use of this method with "original diagnostic cultures," state that "there is but one dependable criterion for virulence, viz.; necrosis of the superficial layers of the skin of the test pig, while it is absent in the control." Bull and McKee[5] discussing their work with "whole-cultures" emphasize that "the absence of necrosis in the control animal was considered to be an indispensable prerequisite to a positive reading." Eagleton and Baxter[6] reporting their modification of Zingher and Soletsky's method[1] in England say:

Readings are taken for the next 3 days. In the case of a virulent diphtheria bacillus the control animal shows nothing or a faint transient flush; the other animal shows a definite rose-red swelling which becomes more marked at each successive reading, and may terminate in slight necrosis.

Moreover, Force and Beattie,[4] who reported the use of intradermal tests for virulence of these organisms in "field-cultures" only a few months after Havens and Powell,[3] specifically state that "any lesions where sloughing occurs on both animals are not produced by diphtheria toxin." The lesion on the protected animal would usually be explained as due either to the presence of contaminating organisms, to allergy of some sort, or to faulty technic.

However, the cultures used in the tests being reported here had been plated and single, well isolated colonies picked to Loeffler's slants, and, in so far as morphology and cultural characteristics are concerned, appeared to be typical of *C. diphtheriae*.

The protected animal (No. 332) was kept under observation until its death on the 25th day after the tests were begun. It appeared to be in good health for 8 to 10 days at which time it appeared sick, began to lose weight and later developed partial paralysis, and at the time of death weighed only 252 gm. as compared to its original weight of 487 gm.

All these conditions suggested that we were dealing with a phenomenon similar to that reported by Feierabend and Schubert[7] and Ivanić, Dimitrijević-Speth and Jovanović[8] and seemed to warrant further inquiry, because of the importance of missing the recognition of a very virulent strain of diphtheria organisms by calling such a reaction negative in routine work. Consequently the culture (No. 1177a) producing positive reactions on both test and control guinea pigs was replated but no contaminating organisms were found. From these plates four well isolated colonies were selected, and transferred to Loeffler's slants and to broth and incubated 24 hours.

At the same time another culture (strain No. 377) which had shown itself toxic in the first test without producing any evidence of reaction in the protected pig was grown in broth to be used with the above cultures in subsequent tests as a control. The morphology and fermentative behavior of these cultures were found to be the same as before.

With these 6 cultures the test was repeated with the result that all subcultures of No. 1177a again gave definite, although somewhat smaller, necrotic areas on both protected and control guinea pigs in 24 to 30 hours. The lesions increased in size to 0.5 cm. or more in diameter by the 2d day on both animals, while culture No. 377 gave a typical strong inflammatory reaction, with necrosis on the unprotected pig and none on the control. The test guinea pig died in about 48 hours, while the protected animal appeared to be still in good health at the end of 18 days. The lesions at the sites of injections on this animal persisted with-

out evidence of subsiding until about the 7th or 8th day. At the end of 16 days they are still clearly evident but appear to be healing rapidly, the animal showing no general ill effects.

According to the work of Feierabend and Schubert [7] the evident differences in intensity and outcome of the reactions in the first and second tests is to be explained on the basis of attenuation from growth on artificial mediums, as these workers and others [8] found that such organisms rapidly decrease in virulence when grown upon culture mediums.

The occurrence and persistence of lesions at the sites of injections in protected animals are explained by these investigators as due to the fact that there exists among the many strains of diphtheria bacilli some which, in addition to the power to produce a necrotizing toxin, possess a high degree of "invasiveness."

The work of both these groups of investigators would indicate that the latter properly accounts for the persistence of the organisms in the tissues at the sites of inoculation even in spite of the presence of antitoxin which is administered previously. They found that 200 units would not save the lives of guinea pigs receiving intradermal inoculation with strains of this character, and at autopsy the bacilli could be recovered from various internal organs, as well as from the nasal discharges. They believe that the protected animals in such cases die from the effects of toxin produced at these various focuses by bacilli which have invaded the tissues and survived the period of passive protection afforded by 200 units of antitoxin. They report the prevention of such an invasion and its consequent fatal termination by the administration of an antibacterial serum, while the fatal result of such an infection was obviated by the use of 1,000 units of antitoxin.

Fermentation tests in Hiss serum water with filtered sugars, and phenol red as an indicator, were made previous to the virulence tests and all strains gave acid production in dextrose, maltose, dextrin, and galactose in 7 days, but not in lactose, sucrose and mannitol. However, strain No. 1177a and some of the others showed a slight but distinct change of the phenol red (from approximately pH 7.8 to pH 7.2) in saccharose in 24 and 48 hours which then reverted to alkaline and remained so.

These circumstances appear to warrant emphasizing the necessity for studying more carefully all intradermal virulence tests of suspected diphtheria cultures showing local reactions on both protected and unprotected pigs, before calling them negative, and attempting to explain them on some other premise. This would seem to be especially true in routine work involving "whole"- or "field-cultures," and in cases where subcutaneous virulence tests lead to death of both animals.

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VITAL STATISTICS

Smallpox from 1929 to 1931—The rough total figures for smallpox cases and deaths reported in the various continents show that in Africa, America, and Asia an increase took place from 1929 to 1930, while a marked fall occurred in 1931, the incidence during the first 6 months of this year being less than half of what it was during the corresponding period of 1930. In Europe, the situation has remained practically unchanged from 1929 to 1931.

The progress that has been made toward the eradication of smallpox since 1920, when nearly 200,000 cases were reported in the European countries and a few countries outside of Europe, is shown by comparative figures for this decade. In the 10 years, the number of cases was reduced to less than 16,000, of which 11,839 occurred in England and Wales alone. Most progress was made in the Union of Soviet Socialist Republics where vaccination was generalized after the revolution, and in Poland and Roumania. Considerable improvement took place also in Germany, where the number of cases reported fell gradually from 2,042 in 1920 to 2 in 1930; and in Italy, where the corresponding figures are 26,453 and 2. In Austria, Belgium, Bulgaria, Denmark, Estonia, Latvia, and Norway, no cases were reported in either 1929 or 1930, while one or two cases only occurred in Germany, Finland, Italy, the Netherlands, Sweden, and Switzerland during 1930. In the Netherlands, where smallpox is, as a rule, very rare, an outbreak of 703 cases imported into Rotterdam occurred in 1929. Vaccinations of the citizens reduced the incidence to 84 cases during the last 3 months of the year. Only 20 deaths were noted throughout the period and no new case was reported after January 1930. The incidence of smallpox varies in France, from 1 to several hundreds, largely among foreign or colonial laborers.

In England and Wales, variola minor has increased more or less continuously since the end of the war (from 280 cases in 1920 to 14,767 in 1927, 10,968 in 1929 and 11,839 in 1930). The fatality rate is exceedingly small: 0.24 per cent in 1930. The geographical distribution of the disease has changed markedly in the last 4 years. Generally speaking, smallpox incidence has declined in northern England (Yorkshire) and has increased in the south and southeast, as well as in London. In 1929, a marked rise took place in its prevalence in London (1,903 cases against 296) and in Northampton, while a fall was observed in Glamorganshire and Monmouthshire. The 1930 Annual Report of the Chief Medical Officer of the Ministry of Health shows that, out of 3,518 patients under 15 years of age, 3,509 (99.8 per cent) were unvaccinated; from ages 15 to 40, out of 3,231 cases, 2,919 (90 per cent) were unvaccinated; and above the age of 40, out of 1,100 cases, only 262 (23.8 per cent) were unvaccinated. In Scotland, where smallpox had declined to a low level from 1922 to 1926, an abrupt rise occurred in 1927, more than 1,500 cases being reported that year and more than 1,400 the following year. A great improvement took place in 1929, when only 18 cases were reported, and in 1930, with 11 cases.

In Northern Africa smallpox is declining (Morocco, Algeria, Tunis) as vaccination progresses, the most remark-

able success being achieved in Egypt. In the latter country, smallpox claimed 2,677 cases with 544 deaths in 1926; in 1930, it caused only 14 cases without deaths. This is undoubtedly due to the vaccination campaign, begun at the end of 1925 and completed in 1926. Approximately 14,600,000 vaccinations were performed, thus reaching practically the whole population, except that in Cairo and Alexandria, where only 619,637 persons were vaccinated in 1930. In Central and Eastern Africa, the prevalence of smallpox, which has been increasing in recent years, continued its upward movement in 1929 and 1930. The observations made in Northern Rhodesia in 1928 are of particular interest. Apparently severe smallpox, alastrim (or amaas) and chicken pox, prevailed at the same time. Its low level in many instances resulted in the spread of the disease (4,035 cases in 1928, 3,855 in 1929 and 4,078 in 1930). In 1929, the smallpox fatality rate was 9.5 per cent—while the rate for alastrim was 7.8—a very small difference. From these indications it was concluded that for administrative purposes no distinction should be made between alastrim, amaas Kaffir-pox, and that every case should be treated as smallpox. The failure of vaccination to control the epidemic was due to inactive vaccine. In some districts, the lymph was inert through exposure to tropical heat, in others it did not give more than 30 per cent of "takes."

Apart from China, for the interior of which no statistical data are available, British India constitutes the most important focus of smallpox in Asia (more than 90 per cent of the cases reported). In 1929, the number of cases reported in India was slightly less than 150,000, and rose in 1930 to 215,204, the latter figure representing roughly the mean incidence of the disease for the three years 1926, 1927 and 1928. The numbers of deaths so far known for 1929 and 1930 are 34,393 and 48,860, but these figures are far from complete. When, after two or three years, revised mortality statistics are available, the provisional figures are more than doubled. Thus, the provisional figure for 1927, 51,776, became 118,197 when revised, and the 39,981 deaths in 1928 grew to 96,123. The high fatality rate of smallpox in India (above 50 per cent) shows clearly that variola major is prevalent there. In sharp contrast with the high prevalence of smallpox in India is its low incidence in Ceylon, where, in recent years, it has seldom attained 1 per 100,000. In Siam and Malaya the incidence of smallpox is comparatively low; and remarkably low in Java and in the Philippines. In the whole of French Indo-China, only 995 cases were reported during the first half of 1931, as against 3,502 during the corresponding period of 1930, but the fatality of the disease remained high (between 30 and 40 per cent). In Japan, the number of smallpox cases is practically negligible, while in Chosen it amounts to a few hundred every year and seems to be increasing. Throughout the Far East, it is the severe type of smallpox which is encountered.

In the Near East, the smallpox situation is, on the whole, favorable. The disease is practically non-existent in Palestine and Transjordan. It is disappearing in Syria; in Turkey a total of 561 cases was reported in 1929, 836 in 1930. The fatality rate varied from one local outbreak to another, ranging from 10 to 50 per cent, but averaging from 15 to 25 per cent. As in past years, New Zealand was free from smallpox in 1929 and 1930. Australia was also free but for 4 imported cases and 1 contact infected by them.

In Northern America the prevalence of a mild type of smallpox remains high. It has increased slowly during the last 5 years. In the United States, 42,282 cases were reported in 1929 and 46,712

in 1930. On the other hand, the fatality rate of the disease, which was already low, has declined still further from 1.8 per cent in 1925 to 0.4 per cent in 1929. In Canada, it was 0.4 per cent in 1929 and in 1930 there were no deaths at all. In both countries, an improvement occurred in 1931, the number of cases notified during the first half of the year being considerably lower than during the corresponding period of 1930—520 against 1,033 in Canada; 24,465 against 38,921 in the United States.

In the western and Rocky Mountain States smallpox is much more prevalent than in those east of the Mississippi. The highest incidence prevailed in South Dakota. Some New England States enjoy freedom from smallpox; such is also the case for Texas, where this freedom is quite remarkable because of the high prevalence of the disease in the adjacent states of Coahuila and Chihuahua, across the Mexican border where mortality rates of 61 and 48 per 100,000 respectively prevail. An idea of the prevalence of smallpox in Mexico may be derived from the number of deaths reported even though notification of cases for the whole of the country is lacking. These deaths numbered 5,497 in 1929 and 9,208 in 1930 (56.1 per 100,000), while the figures for the first months of 1931 show a further increase. There is no doubt that virulent smallpox constitutes a serious public health problem in Mexico.—League of Nations, *Month. Epidemiol. Rep.*, Oct. 15, 1931, pp. 385–396.

Health Conditions in American Samoa—The census of American Samoa, completed in March, 1930, gives an actual population of 9,768 persons, the majority of whom were full-blooded Samoans; the percentage of white persons in the population was so small as to be almost negligible. In 1930 there were 394 births and 177 deaths, resulting in a natural increase of 217, bringing the population to 9,985, the figure on which birth and death rates are computed. Based on this figure the birth rate in 1930 was 39.45 per 1,000 and the death rate 17.73, which rate is 3.66 per 1,000 lower than that for 1929.

The present system of collecting vital statistics in American Samoa is such as to make it unlikely that any births or deaths are not reported. This system became reliably operative May 1, 1928. A triple check is made on all births and deaths in the country. The pulenuu of each village as well as the district nurses are required to submit birth and death reports, and these in turn are forwarded to the central public health office where they are again checked for errors. It has become necessary during the year to send several village pulenuu before the secretary of native affairs for failure to report births and deaths. By taking this disciplinary action, the importance of these returns has impressed itself upon the village chiefs so effectively that omission of a birth or death report is practically impossible.

There were, in 1930, 41 infant deaths, giving an infant mortality rate for American Samoa of 104.07 per 1,000 live births. In 1929 there were 48 infant deaths, 7 more than in 1930. Of the 1930 deaths, slightly over half were due to pneumonia all forms (11 deaths) and acute infectious entero-colitis (11 deaths).

An analysis of the 177 deaths in American Samoa in 1930 shows that 47 per cent were due to the combined causes, tuberculosis, pneumonia, and influenza. Tuberculosis in its various forms caused 35 deaths, giving a death rate of 350 per 100,000. The death rate for the year 1929 was 422, which shows that the reduction for the year 1930 was appreciable. Tuberculosis has been the leading cause of death for several years, but pneumonia, with 40

deaths, led the list of causes this year, with a death rate of 400. Filariasis, which was the primary cause of 19 deaths (190 per 100,000), was the 3d most important cause of death.

An interesting departure from the death rates attributed to these causes in most countries is the record of no suicides, the low rate of 20.0 per 100,000 population, for cancer; and the rate of 120.0 for the entire group of diseases of the circulatory system.

No case of smallpox has occurred in this country in recent years—a record which is attributable, perhaps entirely and certainly in part, to a compulsory vaccination law, which is really effective. It is the practice to vaccinate children in all of the schools every year, one or more good scars in a child being considered evidence of immunity. During the calendar year 1930 there were 613 persons vaccinated. Acute infectious conjunctivitis was prevalent during the year, though there was a noticeable reduction, in the number of cases reported, from 3,361 in 1929 to 1,413 in 1930. Owing largely to the frequency of this disease, the percentage of blindness in the population is high, as shown by the Health Department Survey completed on April 1, 1930, which showed that 2.92 per cent of the total population are blind in one eye, and 1.07 totally blind. No cases of whooping cough, measles, diphtheria, or scarlet fever were reported in American Samoa during 1930; there were only 5 cases and no deaths from typhoid fever. Tuberculosis and acute infectious conjunctivitis are two of the primary health problems of the country, and these problems are receiving the concerted attention of health authorities.—*U. S. Nav. M. Bull.*, 30: 104–33 (Jan.), 1932.

Suicide Statistics—Part 1 (Medical) of the Registrar-General's Statistical Review of England and Wales for the year 1930 contains a table of suicide statistics classified by age, sex and method. There were 5,056 suicides in the year, 3,527 among males and 1,529 among females. Four hundred of the male suicides were among men between the ages of 25 and 35, 548 between 35 and 45, 861 between 45 and 55, 869 between 55 and 65, 482 between 65 and 75, and 147 among men of 75 years and upward.

The figures for women do not follow quite the same progression. There were 250 female suicides among women between 25 and 35 years of age, 276 between 35 and 45, 383 between 45 and 55, 289 between 55 and 65, 167 between 65 and 75, and 37 among women from the age of 75 and upward.

The 1930 totals require, of course, to be coördinated with those of previous years and to be adjusted with statistics of the number of men and women of those decennial age groups. As they stand, the figures indicate that both men and women pass through a bad time between the ages of 45 and 55; in the following 10-year period men seem to be less resilient than women.

As to the method adopted, the figures for both sexes combined show 1,348 cases of coal-gas poisoning, 887 of drowning, 753 of hanging or strangulation, 613 of death by the use of cutting or piercing instruments, 262 of death by firearms, and 214 of railway suicides. In proportion to the other sex, more men than women hanged themselves, and more women than men resorted to gas poisoning. Only 8 women committed suicide with firearms, as against 254 men.

Cases of suicide by taking solid or liquid poisons or corrosive substances amounted to 715. Here the availability of the means is reflected by the detailed figures. Lysol—available, as recent litigation has shown, by purchase from automatic machines—was the means of 354 suicides among men and women, while opium, laudanum, and morphia

were the means used for only 5. The latter figure illustrates one valuable result of the restrictions imposed by the Dangerous Drugs Acts and Regulations.

Other means of suicide in this category were carbolic acid (56 cases), hydrochloric acid (53), potassium cyanide (43), prussic acid, hydrocyanic acid (29), oxalic acid (26), ammonia (19), and strychnine (4). Although there were very few "weed killer" cases of suicide, the figures in this category of poisonings may cause the public to consider how far it is desirable to permit the almost indiscriminate retailing of poisons by persons not specially trained in knowledge of the properties of the drugs they sell.—*Lancet*, 221: 1309 (Dec. 12), 1931.

The Number of Infirm Persons in Germany—The results of the census of infirm persons in Germany, taken in the year 1925–1926, were published recently. According to a report of these findings, the total number of blind persons in Germany at that time was 33,192 or 5.3 per 10,000 of population. The incidence of blindness among males was much higher than among females, partially because of the large number of men blinded during the war; but even after the deduction of the 2,307 war blind, the incidence among the males was still somewhat higher than among females, as has been the case in former statistical reports. Since the census of 1900, the number of blind persons has increased considerably.

The number of deaf-mutes was 31,670, showing a rate of 6 males and 5.1 females per 10,000 of population. In about half, the impairment was congenital. Of the deaf-mutes ages 7 to 20, 88 per cent had received instruction in institutions for the care of deaf-mutes; of those aged 20 to 40, 82 per cent had had such instruction, and of those above age 40, 64 per cent. Of the deaf-mutes above age 20, 82.2 per cent of the men were gainfully employed, mostly as tailors, shoemakers and cabinet makers; of the women, 36.5 per cent were employed chiefly as seamstresses. Of deaf persons who could not hear spoken words even with the aid of an ear trumpet, 8,755 were enumerated, 814 of whom were war injured. Their number was higher in the older age groups; 45 per cent were still gainfully employed: 66.4 per cent of the men and 21.5 per cent of the women. The number of persons with serious bodily infirmities was 276,467; 190,495 men, or 86.4 per 10,000 of population, and 85,972 women, or 29 per 10,000. Even after deducting the 82,972 war injured, the men were still in the majority, chiefly because of the hazards of industry, in the wider sense. The number of persons with slight bodily infirmities was 116,974; 89,784 males (among which were 45,007 war injured) and 27,190 females. The number of persons with mental impairment was 207,514; 105,374 men, including 6,090 war injured, or 37.9 per 10,000 of population, and 102,140 women, or 34.4 per 10,000.—*J. A. M. A.*, 98: 156 (Jan. 9), 1932.

PUBLIC HEALTH ENGINEERING

SURVEY OF CONNECTICUT'S SHORE BATHING WATERS*

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THE Connecticut State Department of Health has recently completed a fairly exhaustive survey of the sanitary condition of all of Connecticut's shore waters on Long Island Sound. For many years, and particularly in recent years, the department has received numerous inquiries as to the safety of sections of the shore for bathing. It has been impossible to give intelligent answers to these questions because of (1) the absence of complete data as to sewer outlets along the shore and (2) a dearth of information as to the bacteriological quality of Connecticut shore waters.

The survey was undertaken with the object of compiling sufficient information to enable the department to serve better the citizens of the state in their desire for specific information as to the sanitary condition of bathing areas and also to point out to municipal authorities and other interested persons the "danger spots" along the shore which are seriously affected by sewage pollution.

POLLUTED BATHING WATERS

It is very difficult to obtain accurate epidemiological evidence as to just what sickness is caused by bathing in polluted water. An exhaustive survey by the Committee on Bathing Places of the American Public Health Association was confined mostly to indoor swimming pools. The data obtained were not very conclusive. They report an epidemic of typhoid fever at a boys' camp from bathing in polluted water and many cases of eye, ear, nose and throat infections. Some of these latter infections might be due principally to lowering of resistance from chills.

Considerable interest has been evidenced of late by many public health workers in the possibilities of skin infections from bathing. Some minor outbreaks of skin disease among salt water bathers have come to the attention of this department. Unfortunately it is a fact that little is known as to the exact manner of spread of these skin infections—whether the infection has been spread on land rather than in the water or whether the water has acted as a vehicle of transmission from one bather to another, or whether the source of infection has been sewage present in the water.

METHOD OF THE SURVEY

Maps of the Connecticut shore were prepared to indicate the locations of sewer outlets along the entire Long Island shore. All major outlets were included in the survey although all individual house outlets may not have been spotted. Data were obtained as

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This is a contribution of the Committee on Bathing Places of the Public Health Engineering Section of the A. P. H. A.

to the population contributing sewage and other pertinent facts about the sewers. Local health officers coöperated in furnishing considerable information along this line.

Nine hundred and twenty-two sampling stations were chosen at intervals of approximately 1,000 feet along the entire Long Island shore in Connecticut, including areas used for bathing and intervening areas.

Four samples for bacteriological analysis were collected at each station to represent conditions at 4 different stages of tide. The samples were taken as nearly as possible at high, low, one-half ebb, and one-half flood tides. The samples were taken in almost every case from a boat in from 2 to 6 feet of water. They were obtained by dipping a sterilized bottle just below the water surface.

Samples were examined only for the presence of organisms of the coli-aerogenes group. The lactose broth method was employed, using 4 dilutions of the sample for the most part, with the use of 5 dilutions where any serious pollution was suspected. Dilutions were in geometric progression from 10 c.c. to .01 or .001 c.c. Partial confirmation on Endo agar was the limit to which the tests were carried.

EFFECT OF WIND

Although records were made of the direction of the wind, no attempt was made to collect samples under different conditions of wind. It is believed that the run of tides is the principal factor to be taken into account in the travel of pollution along the Connecticut shore but minor discrepancies would undoubtedly exist with certain conditions of wind. Of course, too, the tidal movements are frequently influenced by strong winds. In the survey classification described later, nearness of polluting influences and possibilities of shifting direction of pollution travel with different wind conditions were taken into account.

EFFECT OF BATHERS UPON BACTERIAL POLLUTION

In attempting to evaluate the analytical results obtained in the course of the Connecticut survey, one of the uncertain factors was believed to be the possible effect on the results caused by bathers in the water at the time of collection of samples. Incidentally, notes were made as to the relative amounts of bathing where samples were collected along beach areas during the survey. It is an unfortunate circumstance in Connecticut that most of our densely populated bathing waters are conveniently located outside of the harbors of our large cities and so are subject to effects of distant sewage pollution. This introduces complications in interpreting analytical studies as to effects of dense bathing.

In 1930, some studies were made at Hammonasset Beach where samples were collected in the midst of some large week-end crowds, and in 1931, similar studies were made at Sound View with crowded bathing conditions. Both areas were chosen because of their relative freedom from any serious outside polluting influences. Bacterial results on the waters sampled with dense bathing were compared with the same waters after tidal changes and with little or no bathing.

While there was found to be a slight increase in the bacterial pollution with dense bathing, the difference was not very significant and there seemed to be little correlation between the quantity of bacterial pollution and the number of bathers. As a result of our studies, we do not believe that the pollution introduced by bathers seriously affects our classification of bacterial results although in some of the country's large, thickly populated bathing areas, different conclusions would undoubtedly be reached. Bacterial pollution by bathers is evidenced by studies of small swimming pools but along the shore the

diluting influences are great and tend to minimize the effect of pollution of the shore waters by bathers.

COMPUTATIONS OF BACTERIAL POLLUTION

The values for *B. Coli* content were computed by assuming 1 *B. Coli* originally present in the greatest dilution to give a positive test. For example, positive in 10 c.c. and 1 c.c. and negative in 0.1 and 0.01 c.c. is called 100 *B. Coli* per 100 c.c. If it is desired to express the results as the so-called most probable number of *B. Coli* per 100 c.c., the above figure must be multiplied by the factor 2.3. This would be approximately correct except where so-called anomalous results are obtained, such as a sample showing positive in 10 c.c., negative in 1 c.c., and positive in 0.1 c.c. There were comparatively few such cases and these were treated by recessing to the next less dilution, similar to the process used in scoring oysters. The method used has the advantage of simplicity and furnishes a satisfactory method for comparing results.

The final result for each station was obtained by averaging the 4 computed *B. Coli* counts which seemed as satisfactory as any method. It is realized that undue weight is given in this method to 1 poor result but on the other hand, it emphasizes the occurrence of chance pollution which may be dangerous.

BACTERIAL STANDARDS FOR BATHING WATERS

The classification of the safety of bathing waters on the basis of analytical results is complicated by the fact that no accepted standards exist as a basis for such classification. In public health work we have gradually come to adopt certain standards, usually proposed by certain leading scientists and perhaps later changed as a result of experience until these standards are found to be possible to meet and to be sufficiently stringent to avoid trouble as shown by epidemiological evidence. Our standards for drinking water supplies and milk have been developed in this way. Similarly, bacterial standards for swimming pool waters subject to continuous or intermittent disinfection have been worked out.

In considering drinking water and indoor swimming pools as compared to salt water beaches and large inland streams, there is the difference that ready methods of chlorination or filtration are available in the former case whereas we are dependent on dilution and natural purification in the latter case. There is another distinction which should be borne in mind between the presence of *B. Coli* in salt water beaches or inland streams and in indoor swimming pools. The source of water supply for an indoor swimming pool is either a public water supply or a private water supply relatively free from *B. Coli*. Therefore, *B. Coli* found in indoor swimming pools must be regarded as of human origin. *B. Coli* in the waters of inland streams may be of animal origin and of no great sanitary significance. The same may be true to a lesser extent of harbors receiving a large flow of fresh water from land subject to contamination from animal sources—cultivated land, manure piles, etc.

BACTERIAL CLASSIFICATION

It has already been stated that no acceptable analytical classification of bathing waters has ever been made, nor is any arbitrary set of standards entirely satisfactory. It was originally attempted in these studies to set up tentative analytical classifications such as Good, Fair, Doubtful, Poor, and Very Poor. This was later abandoned because of the belief that the classifications were on too arbitrary a basis and because of the possibilities of misinterpretation of results. Instead, a relative

classification of results was attempted. This classification is as follows:

TABLE I

	Average B. Coli per 100 c.c.
Class A +	0–10
Class A —	11–50
Class B	51–500
Class C	501–1,000
Class D	Over 1,000

The reason for the division of Class A into 2 parts is that it was desired to work out a basis of comparison with the classifications made on the basis of the sanitary survey, as described later, but, whereas it was felt that a line of demarcation could be drawn through the analytical results in this highest class, no such distinction could properly be made in the sanitary survey classification which groups the areas as A, B, C, and D. Of course, if desired, the distinction could be dropped and Class A + and Class A — could be grouped together as Class A.

A rough total of the entire length of Connecticut shore of Long Island included in this study is 181.3 miles. Following is a tabulation of the mileages and percentages of the total falling into each of the classifications on the basis of analytical results:

TABLE II

	Mileage	Percentage
Class A +	72.2	39.8
Class A —	43.8	24.2
Class B	33.7	18.6
Class C	18.5	10.2
Class D	13.1	7.2
Total	181.3	100.0

Reference is made to the manner of choosing sections of shore and the averaging of the *B. Coli* results at the included stations. This is given under the next sub-heading.

ESTABLISHMENT OF SHORE SECTIONS

Principally on the basis of the sanitary survey data, but also with some regard to the analytical results, the shore was divided into sections varying in length from 1,000 feet to 1 or more miles. These shore sections were then classified according to the sanitary survey data and also according to the analytical data.

It is important to note that the classification of these sections both on the basis of the analytical data and also of the sanitary survey is the end point of this study.

The analytical classification of any particular section is made by averaging the results of the different individual stations included. The results for each station, as before mentioned, are secured by averaging the *B. Coli* counts for the 4 tidal stages. The sanitary survey classification, of course, was purely a matter of judgment by the engineers employed on the work.

SANITARY SURVEY CLASSIFICATION

As has been mentioned, a sanitary survey classification of the shore areas was made. The sanitary survey included the location of sewer outlets along the entire shore with the accumulation of data as to the flows of sewage and contributing population. In connection with studies of shellfish areas in Greenwich, Norwalk, New Haven, and Bridgeport harbors, float studies were carried out by the State Department of Health in 1927 and 1928 and the results of these studies were available in considering bathing waters in these localities.

The sanitary survey classifications are: Classes A, B, C, and D. No A + or A — is included in the sanitary survey classification as this would seem to give a false impression of accuracy. Class A represents good conditions, as disclosed by the sanitary survey; Class

D represents very poor conditions on the same basis; Class B might be considered to represent fair to doubtful conditions; and Class C would include doubtful to poor conditions. The 2 intermediate classes are somewhat difficult of definition.

Following is a tabulation of the mileages and the percentages of the total, falling into each of the classifications on the basis of the sanitary survey:

TABLE III

	Mileage	Percentage
Class A	69.3	38.2
Class B	76.6	42.2
Class C	23.0	12.7
Class D	12.4	6.9
Total	181.3	100.0

CORRELATION BETWEEN BACTERIAL AND SANITARY SURVEY CLASSIFICATIONS

Before proceeding to a discussion of the specific sections of the shore, it is of interest to present a tabulation showing the correlation between the classifications on the basis of analyses and the classifications on the basis of the sanitary survey information.

TABLE IV

Bacterial Classification	Sanitary Survey	Per Cent of Total
Class A +	Class A	36.3
Class A —	Class A	1.2
Class B	Class B	11.7
Class C	Class C	6.7
Class D	Class D	6.2
		62.1

This table is of great interest in that a very close correlation is shown. The summary of the above percentages indicates that 62.1 per cent of the area studied showed an exact correlation.

In Table V are presented the data showing the variations between the bacterial and sanitary survey classifications in the 37.9 per cent of the area where exact correlation was not found. A study of this table discloses that 36.7 per cent of the total area showed a difference of only 1 class in the 2 classifications.

The remaining portion of the total is but 1.2 per cent and this did not show a close relationship. In some sections falling in the last group, unexpectedly good bacterial results were secured in areas looking very questionable on the basis of the sanitary survey, and, conversely, poor bacterial results were secured in areas apparently free from serious pollution. The former discrepancy might be due to the laws of chance in sampling or to certain tidal movements or other reasons; the latter might be caused by some chance pollution by boats or due to concentration of surface wash entering the area from cultivated land.

TABLE V

Bacterial Classification	Sanitary Survey	Per Cent of Total
Class B	Class A	0.7
Class C	Class B	3.1
Class D	Class B	*1.1
Class A +	Class B	3.5
Class A —	Class B	22.9
Class B	Class C	6.0
Class C	Class D	0.5
Class B	Class D	*0.1
		37.9

* Little correlation shown.

GRAPHICAL AND DETAILED PRESENTATION OF DATA

Office reports furnish detailed discussions of the conditions along various sections of the shore with a detailed tabulation of the areas.

For office use, the data have also been plotted on U. S. Coast and Geodetic Survey charts. Information concerning these data is available in the case of inquiries addressed to the State Department of Health.

CONCLUSIONS

1. It is believed that the study of Connecticut shore waters has given a very satisfactory basis for classifying the sanitary condition of the various sections of the shore. While no sufficient basis exists for any system of absolute classification, such as "Good," "Fair," etc., a relative classification is possible and enough detailed information is available from the analytical results and the sanitary survey to enable the Department to answer intelligently most inquiries as to bathing areas along Long Island Sound. A very high degree of correlation is shown between the relative classifications of the analytical results used in this study and the classifications decided upon on the basis of the sanitary survey (or judgment).

2. Many miles of Connecticut shore were found to be in excellent sanitary condition, testifying to the great recreational asset the state has in her salt water bathing beaches.

3. The effect of harbor pollution in Connecticut is rapidly dissipated by dilution available in Long Island Sound so that the sewage from our cities and towns is not a factor, to any great extent, in polluting the main body of water in the Sound. The principal considerations are as to the harbor waters of themselves and waters in close proximity.

4. The harbors of many of our cities and towns are highly polluted and improvements are imperative. The effect of this harbor pollution exists also in waters in close proximity to our harbors. Unfortunately, it is these waters in and near our harbors that are frequently developed extensively for bathing because of their convenient nearness to centers of urban population. Some of our bathing beaches at such locations are close to the border line of safety. The salutary effects of sewage treatment at these points are exemplified by the effects noted where treatment exists. The situation does not call for hysteria or undue alarm but a steady program of improvement along the lines now aimed at by state and municipal authorities should be followed.

5. The Housatonic and Connecticut Rivers, while subject to a large amount of pollution, undergo a great deal of self-purification before they enter the Sound, and the dilution available at their mouths is great enough to minimize the influence of pollution from these rivers so that they are no appreciable factor either in the pollution of much of the shore line or the main body of water in the Sound. This does not mean, however, that these rivers should not be improved in condition both with respect to certain tributaries and the rivers themselves where local and cumulative pollution is objectionable.

6. Numerous individual cases of local pollution were disclosed by the survey. Many of these pollution sources are of small magnitude but it is frequently the case that relatively small amounts of pollution in close proximity to bathing areas are more dangerous than far greater amounts at a greater distance. Coöperation of the public and better appreciation of desirable sanitary standards should gradually bring about improvements. The day is going by when the average citizen is content to build a house on the shore, pipe the household sewage to the water in front of the house, and then bathe in the water.

7. Increasing sewage pollution of our rivers and harbors will result in conditions more threatening to the safety of bathing beaches and shellfish areas in their proximity than may be shown by present studies, if not offset by installation of sewage treatment plants.

FOOD AND NUTRITION

Composition of Rabbit Meat—These tests were made in the Bureau of Animal Industry of the U. S. Department of Agriculture. Four normal healthy domestic rabbits ranging in age from 10 months to 1½ years were used in the experiment. The animals were slaughtered and dressed in the regular way. The heart, liver, and kidneys were removed and weighed separately; the meat was then stripped from the bones and each weighed separately. The meat was prepared and analyzed in accordance with the official method of the Association of Official Agricultural Chemists. The composition of the meat was found to be similar to that of poultry, the content of moisture and protein being relatively high and that of fat rather low.—H. R. McMillan, *J. Home Econ.*, 23: 1149 (Dec.), 1931.

Irradiated Milk: the Energy Requirements for Antirachitic Activation—The radiation used in these experiments was obtained from various types of carbon arcs and mercury arcs operated under known conditions and with known energy. Fluid milk containing 1.2 per cent of butterfat was used, and the irradiation was carried out in 1,000 lb. lots. The milk was exposed to the radiation in the form of a moving film which received the rays at constantly changing cycles of incidence, varying from 0 to 90°. The periods of exposure were 8, 16, 32, and 48 seconds. The milk was immediately dried by the Just process and hermetically sealed in inert gas.

White rats, 28–30 days of age, were fed on the Steenbock and Black (*J. Biol. Chem.*, 64: 263, 1925) rachitogenic Ration 2965 for 21 days followed by 10 days of supplemental feeding of 10 c.c. daily of the reconstituted dry milk. At the end of this period the line test and bone ash determinations were made. The results show that substantially the maximum antirachitic potency which could be imparted to milk was brought about with the first few seconds of exposure. The objectionable flavor and odor so often reported as developing in milk after exposure to ultra-violet rays were not noticed.

Clinical tests were also made on 11 colored infants during the winter months. The infants were fully protected from rickets. The milk also showed definite curative value in a number of cases as shown by the marked healing in Roentgenograms.—G. C. Supplee, M. J. Dorcas, and Alfred F. Hess, *J. Biol. Chem.*, 94: 749 (Jan.), 1932.

Protein Intake and Basal Metabolism of College Women—Eighty-five women students, ranging in age from 19 to 37 years, 85 per cent being between 19 and 24 years of age, were studied in order to determine the habits of protein consumption and the possible relationship between protein intake and basal metabolic rate. The average protein intake was 0.94 gm. per kg. body weight, while the average protein intake of male students was previously shown to be slightly more than 1 gm. per kg. body weight (*Am. J. Physiol.*, 82: 577, 1927; 89: 403, 1929, and *J. Biol. Chem.*, 61: 109, 1924). The average 24-hour urinary nitrogen excretion for the group was 7.69 gm. It is suggested that the lower protein intake of women may be in part responsible for the fact that their basal metabolic rate is lower than that of men.—Rossleene Arnold Hetler, *J. Nutrition*, 5: 69 (Jan.), 1932.

Staphylococcus Food Poisoning—The discovery of a new type of food poisoning due to the toxic products of staphylococci seems to explain a certain number of outbreaks in which no Salmonella bacilli are found.

In 6 recorded instances, staphylococci are quite well established as the cause of food poisoning. In 4 of these instances, food epidemiologically implicated contained large numbers of staphylococci. Pure cultures of these staphylococci yielded broth filtrates which, when swallowed in small amounts (2 to 10 c.c.) by human volunteers, produced symptoms noted in original patients. There are also 2 recorded instances in which staphylococci growing in milk have caused illness when swallowed by human beings. In 1 of the above cited instances, staphylococci of the albus type were implicated, yellow staphylococci of the aureus type being concerned in the other 5 instances. Other instances are cited in which staphylococci were the probable but not proven causative agents.

Differences in food poisoning due to staphylococci and that due to members of the Salmonella group may be found in the incubation period, mortality, and the amount of sterile broth filtrate which produces characteristic symptoms in human volunteers. In staphylococcus food poisoning the symptoms usually occur within 2 to 4 hours; no deaths have occurred in any of the above mentioned outbreaks or in approximately 100 human volunteers who have become ill after swallowing sterile toxic filtrates, and amounts as small as 2 c.c. of sterile broth filtrates of staphylococci will produce characteristic symptoms. In Salmonella food poisoning, the incubation period averages from 6 to 12 hours, with an estimated mortality of about 1 to 2 per cent, and Salmonella filtrates have been swallowed by human volunteers in amounts as large as 145 c.c. without producing characteristic symptoms.

Staphylococci concerned in food poisoning do not seem to differ culturally from the common and widely distributed members of this group. Toxin producing strains of both albus and aureus varieties have been found. Some strains may produce a toxin at one time and not at another. Their source is not known with any degree of certainty because of their wide distribution.

Further study of the properties of the toxic substance is in progress. There is no evidence of a true immunity to staphylococcus toxin although there appears to be some degree of tolerance. Repeated attacks may be produced in a volunteer by successive feeding. Boiling for 30 minutes does not destroy but perhaps weakens the toxin. Chlorination and storage at low temperatures do not destroy the toxic quality of broth filtrates.—Edwin O. Jordan, *J. A. M. A.*, 97: 1704 (Dec. 5), 1931.

Does Freezing Kill Cl. Botulinum Spores?—The production and marketing of frozen vegetables and fruits without heat sterilization has raised the question as to whether or not there is a possibility of botulinus poisoning arising from the consumption of such products which had been improperly handled. Two general methods are used in the freezing of food products, "quick" freezing in which the food material is solidified in a comparatively short time by exposure to very low temperatures, ranging from —50° to —85° F., and "slow" freezing in which the packaged materials are placed in a refrigerated room and solidified only after several hours of exposure. Freezing the spores with solid carbon dioxide ice resembles the treatment in "quick" freezing, and exposure in a cold room is comparable with "slow" freezing. The effect of freezing upon the botulinus spores is obviously of first importance, and studies have been made in which the conditions of experimentation have

resembled those existing in commercial practice. Dried *Cl. botulinum* spores (Type B), suspended and heated in a Sörensen buffer solution of pH 6.9, have been frozen with solid carbon dioxide ice, defrosted at intervals, and the total numbers of living spores as well as the presence of toxin determined. There was no reduction in the number of living spores, neither when defrosted and examined immediately after being frozen, nor when they have been frozen for 9 days and then examined. Subcutaneous injections into guinea pigs showed that no toxin had been liberated from the spores by the freezing.

A suspension of dried spores of the same botulinus culture was divided among several test tubes and frozen by exposure in a refrigerated room held at approximately 20° F. Twenty-four to 36 hours were required for the suspensions to be thoroughly solidified. Examination of portions 1 day after being frozen and periodically to 11 weeks showed that there was neither a reduction in the total numbers of living spores, nor was toxin liberated.—Lawrence H. James, Abstr., *J. Bact.*, 23: 47 (Jan.), 1932.

A Study of Escherichia Coli in Ice Cream—This study was undertaken primarily to see if *E. coli* would survive pasteurizing temperatures in ice cream mix. Seventy-three samples of ice cream were examined and it was found that they contained from 200 to 157,000 bacteria per c.c. Forty-five samples produced gas and 21 produced a metallic sheen on eosin-methylene-blue agar. The majority of the samples were slow acid-producers in litmus milk. A Gram-positive organism was found that produced a metallic sheen on eosin-methylene-blue agar. When incubated in gentian-violet-lactose-peptone bile in combination with *Aerobacter aerogenes* and streaked on eosin-methylene-blue agar, it gave the partially confirmed tests for *E. coli*. This organism is still being studied.

Two *E. coli* cultures survived 62.8° C. in milk; 13 cultures survived 62.8° C. in ice cream mix. At 65.5° C. 1 culture survived 3 trials out of 4, and at 68.3° C. the same culture survived 1 out of 4 heatings.

Sugar, gelatine, serum solids, and fat showed some protective action for bacteria in the order named. Heat-resistant *E. coli* showed a slight pathogenicity when given orally to guinea pigs. Dominick and Lauter liquid media seemed to be more satisfactory than Salle's.—J. Venceslav Anzulovic, Abstr. *J. Bact.*, 23: 56 (Jan.), 1932.

Epidemics of Septic Sore Throat of Milk Origin; Present Status of Bacteriology and Epidemiology—From studies made at the University of Illinois, College of Medicine, of septic sore throat, the following points seem to be established:

1. The epidemics are sudden, sharp and severe, indicating a massive dosage of the infecting agent.

2. The sick are largely limited to users of 1 milk supply. There are relatively few contact infections.

3. Epidemics rapidly recede when the infected milk supply is cut off or the milk pasteurized.

4. Usually 1 cow is found with an udder infected with an encapsulated hemolytic streptococcus. This organism produces large mucoid, watery, spreading colonies growing especially well on ascites blood agar. These organisms were observed in the Chicago epidemic of 1910–1911 and have become known since then as the *S. epidemicus*.

5. Experiments indicate that when these streptococci are implanted in the cow's teat, they will rapidly ascend the duct and localize in the udder, causing mastitis. They may continue there for long periods thus giving rise to the carrier state. The udder may or may not reveal gross physical changes.

6. Similar encapsulated streptococci are uncommon in the throats of normal persons (less than 1 per cent) but more common in infected throats (12 per cent of tonsils). Sporadic cases of septic sore throat indistinguishable from epidemic cases are occasion-

ally seen. From such throats encapsulated streptococci of the epidemicus type may be found.

7. These encapsulated streptococci produce toxins which give rise in animals to specific neutralizing antiserum. The toxins cause specific skin reactions in susceptible persons (differing from scarlet fever toxin). A study of several strains indicates that they are heterogeneous by the agglutination test. Agglutination tests however are often unreliable for encapsulated organisms. We have not as yet compared the toxin-antitoxin properties of a number of different strains.

8. From a study of many epidemics of septic sore throat, it appears that not infrequently cases of scarlet fever and erysipelas occur as complications. There is marked variation in this respect. At times scarlet fever and skin rashes are relatively common. Again they may be rare or absent and erysipelas relatively common. On the other hand it is well known that sore throat without rash is common during epidemics of scarlet fever.

9. Strains of streptococci classed as scarlet fever or erysipelas organisms on the basis of skin and other tests at times develop capsules and grow quite like strains of *S. epidemicus*. Such strains may be the cause of milk-borne scarlet fever. The variability in these clinical manifestations together with the variability in properties of streptococci from epidemics of septic sore throat, scarlet fever and erysipelas suggest the possibility of a variable toxigenic and serologic property.

10. A study of the world distribution of epidemics of septic sore throat of milk origin reveals 3 general localities: namely, (a) Great Britain, (b) Scandinavia and Denmark, and (c) United States and Canada. In other parts of the world the methods of treating milk supplies may explain their freedom from infections.

—D. J. Davis, Abstr., *J. Bact.*, 23: 87 (Jan.), 1932.

INDUSTRIAL HYGIENE

Occupational Disease Clinic Established—A weekly clinic for the benefit of labor and industry involved in occupational disease hazards has been established at the research hospital of the medical college of the University of Illinois in Chicago. Clinics will be held each Saturday from 12 noon to 2 p.m. The work of the clinic will be limited strictly to diagnosis and consultation. No treatments will be given.

Any person in Illinois of impaired health who has been exposed to any occupational disease hazard will be accepted at the clinic for examination. Occupations which involve these risks include painting, stone cutting, battery manufacturing and repairing, garage work, zinc smeltering, varnishing, printing, lead mining, enameling and various others. Hospital facilities will be provided for those patients who need it.

The object of the clinic is primarily to make more easily available the special medical knowledge and facilities needed for the control and prevention of occupational diseases. Incidentally it provides a teaching center for medical students and for physicians who wish to specialize in industrial medicine.

The plan of operating the clinic is to work in close coöperation with industrial physicians and with the medical profession. It is anticipated that a diagnosis of lead poisoning, for example, or silicosis in any patient will lead not to appropriate treatment of the patient alone but to the application in the place of employment of measures calculated to minimize the risk to other employees.

The establishment of the clinic is the second important step taken re-

cently by the State Department of Public Health in its industrial hygiene program. A few months ago the McCord test for detecting the onset of lead poisoning was added to the diagnostic laboratory procedure provided by the Department.—*Illinois Health Messenger*, 3, 22 (Nov. 15), 1931.

E. R. H.

Coal Miners and Tuberculosis—Coal miners, although so constantly exposed to coal dust and stone dust, are notoriously less liable to pulmonary tuberculosis than workers in other dusty trades, and Haldane has pointed out that this situation has existed for generations. "It is difficult to resist the conclusion that in some way the inhalation of dust in coal mines tends to prevent phthisis."

The author suggests that this antituberculous property may depend upon the well known adsorptive power of coal dust and not upon any antiseptic action. Recent observations by the author and Dr. Weatherall have proved that coal dust in fine division can adsorb and inactivate tuberculin solutions to a marked extent.

When it is recalled that the lungs of silicotic and anthracotic coal miners may contain over one hundred grams of coal dust, as shown by Cummins and Sladden in their recent work, it will be readily conceded that the available adsorption potential of carbonaceous matter in silico-anthracotic lung tissues may be very great.

Accumulated coal dust in the lungs is not, however, an unmixed blessing. It leads to fibrosis and devascularization and sometimes to colloquative changes and even cavity formation so that emphysema develops with serious interference with respiration. Most old coal miners are dyspneic, although many work to a great age "short of breath" and suffering from copious sputum, cough, and sometimes asthmatic trouble.

While the collier's death rate from tuberculosis is relatively low, his death rate from "bronchitis" is very high. Possibly the word "bronchitis" is not well chosen. Coal miners possibly die from dyspnea instead of merely being dyspneic. Certain it is that stone dust and coal dust combined produce in time a state in which the breathing efficiency of the lungs is seriously compromised. The attitude of complacency commonly assumed toward the risks run by coal miners from exposure to mixed dusts is unjustifiable. Coal mining involves a definite risk of pneumoconiosis.

Two valuable lines of prophylaxis are open to further investigation: A closer study of the stone dust used to diminish the danger of explosions, and the reduction of dust from hard stone during the use of compressed air drills. The success attending the use of respirators against lethal gases during the late war encourages the hope that the risks in dusty industries may be as efficiently solved.—S. Lyle Cummins, *J. State Med.*, XXXIX, 9: 526–536 (Sept.), 1931.

E. R. H.

International Conference on Industrial Accidents and Diseases—This Conference held at Geneva, August 3–8, 1931, was attended by 450 delegates from many countries, including Australia, Japan, the United States, and South Africa.

The conference divided into 2 sections, for accidents and diseases respectively. The agenda included the following subjects:

1. Cutaneous affections viewed from an industrial standpoint
2. The influence of the previous state of health in regard to sequelae of industrial accidents and diseases, discussed by joint meetings of both sections
3. Traumatic lesions of the blood vessels (forms of arteritis and thrombophlebitis), and later sequelae and adaptation in cases of trau-

matic lesions of the spine, discussed by the accidents section
4. Pathology of workers in the cement and artificial stone industries
5. Receptivity of the system to toxic substances utilised in industry
6. Fatigue, discussed by the diseases section

More than 250 papers were submitted. An exhibition of photographic and radiographic slides, casts, and other graphic material was held in Geneva University.

It was decided to hold the next Congress at Brussels, 1935.—International Labour Office (League of Nations), *Indust. & Labour Inf.*, XXXIX, 10: 331 (Sept. 7), 1931. E. R. H.

Health of Workers in the Engineering Industry—Among the non-occupational health factors there are the general ones of good trade, regular employment, and decent earnings; the personal factor of physical health; and the environmental factor of home and its surroundings.

Among the occupational health factors characteristic of engineering are *sandblasting* in which oftentimes shot-blasting might be substituted with great decrease of hazard; *chromium plating* in which respirators and rubber gloves, aprons, etc., should be used; *cellulose spraying* in which the "pear-drop" odor of volatile amyl compounds and certain benzene derivatives occur; *oil dermatitis and boils* in which it is considered that a suitable bactericidal fluid for treatment of oil has been evolved; the *accident* relations especially associated with factors of temperature and humidity and the necessity for safety officers; and *fatigue* occasioned by excessive physical exertion or by monotony of work.

Rationalization in industry is a modern tendency; more and more work is being delegated to the machine. At the same time the machine and its tools should be constructed with regard to the physical comfort of the future operative. Thus, the prevention of fatigue as well as of accidents depends upon the maintenance of psychological and physiological normality.—Arthur Massey, M.D., D.P.H. (Coventry), *J. State Med.*, 39: 10, 569–576 (Oct.), 1931. E. R. H.

The Effect of Rhythm and Reverie on the Machine Worker—Machine workers whose jobs permit the establishment of rhythmical bodily motions soon experience a "mind freedom," which permits protracted reveries.

Such reveries are often pleasurable mental excursions which leave the worker in an emotionally quiescent state. The triple combination of (a) response to measured cadence, (b) day dreaming, and (c) earning one's living accounts for great masses of human beings remaining contented year after year at work which requires only muscular attention. Bodily response to rhythm, and mental tendency to day dream, are among the oldest habits of man. When a human being engages in age-old customs, a sense of satisfaction usually accompanies such acts.

Machine made reveries may consist of nothing more than idle and fanciful musings or even morbid worries. On the other hand, they may be meditations of great merit. Samuel Gompers and Michael Pupin are examples of men who planned great things while they were still uneducated routine workers and later in life made imperishable contributions in their respective fields. Each in his autobiography clearly traces such deeds to the "mind freedom" permitted by certain work in their early lives. A number of other cases of reveries on the job are cited, among them being the experiences of the investigator himself while a conveyor worker at the Ford Motor Company plant.

The paper concludes with the suggestion of further research into the pos-

sibility of directing the mind habits of rhythmical workers into more generally constructive channels.—Stanley B. Matheson, *Ohio J. Sci.*, XXXI, 5: 425 (Sept.), 1931. E. R. H.

Annual Report of the Commissioner of Industrial Alcohol—This mimeographed statement for the press issued by the Bureau of Industrial Alcohol, U. S. Treasury Department, provides data concerning the production of alcohol, the manufacture of synthetic alcohol from ethylene during the past year on a commercial basis, the amount of alcohol and rum (149,303,438 proof gallons) withdrawn from bond for denaturation, and a table of the number of wine gallons of alcohol used in some 40 different manufacturing processes during the previous fiscal year. The number of permits in force as of June 30, 1931, was 177,833 divided between numerous manufacturing, business, educational, and medicinal usages (classified).

Modification of formulas for specially denatured alcohol have taken place following considerable research which has resulted in reducing to a minimum the illegal distillation of alcohol preparations for the purpose of obtaining potable alcohol. Weaker formulas were eliminated. On January 1, 1931, the bureau eliminated the use of wood alcohol in completely denatured alcohol; revoked completely denatured alcohol formula No. 1; and revised completely denatured alcohol formula No. 5 by replacing wood alcohol with *alcotate*, a new denaturant developed in the laboratory at Washington after several months of intensive research work. With the addition of *isopropanol* and *alpha terpineol* as additional denaturants to formula No. 5 and the addition of *aldehol*, the alcohol is rendered totally unfit for use as a beverage and impracticable for illegal recovery of potable alcohol.

The report mentions the extent of the use of medicinal whiskey, rum and brandy products, distilled spirits, and wine, with a word about the issuance of basic permits which have now been standardized, and the control of plant operations. E. R. H.

Tanning—The extent and scope of the tanning industry in the U. S. and in the provinces of Canada is briefly summarized, after which conditions in 5 individual plants which were observed in field investigations are discussed.

A description follows of the methods of tanning, from the preparation of hides to dyeing and finishing. The general consideration of hazards, prepared by Dr. Carey P. McCord, takes up the different operations in order and the outstanding hazards. Among these latter are discussed synthetic tannings, anthrax, hydrogen sulphide, dyeing and coating, odors, pyogenic infections, and mechanical hazards.

As is usual with this series of reports there is a complete summary associating each particular occupation with its hazards, the list in this case involving some 100 different jobs.—Retail Credit Company, Atlanta, Ga., *Indust. Rep.*, VI, 12: 145–161 (Dec.), 1931.

E. R. H.

A Survey of State Legislation of Interest to Physicians Since January 1, 1931. Changes in Present Compensation Laws—An Ohio bill was passed adding to the list of compensable occupational diseases: manganese dioxide poisoning, radium poisoning, tenosynovitis and prepatellar bursitis, chrome ulceration of the skin or nasal passages, potassium cyanide poisoning and sulphur dioxide poisoning. A New Jersey law designates as " radium poisoning " that occupational disease hitherto listed as " radium necrosis " in the New Jersey act. Citation is made of a number of bills in various states which failed of enactment.—William C.

Woodward and Thomas V. McDavitt, *A. M. A. Bull.*, 26, 8: 202 (Nov.), 1931. E. R. H.

Functions of an Industrial Eye Clinic—The benefits gained by industry through eyesight of employees are pointed out in a report just issued by the Metropolitan Life Insurance Company under the title "Functions of an Industrial Eye Clinic." This study further describes methods employed by leading industrial enterprises for supervising the visual conditions of workers through plant clinics.

"In almost any industrial plant where careful eye tests are conducted by an oculist, it will be found on the initial eye survey of employees that about 40 to 50 per cent have subnormal vision needing correction," the report states, and proceeds to describe the equipment and procedure necessary for correcting this condition. Several illustrated pages are devoted to a description of the technic of eye examinations, including a section on the many types of color blindness and recently devised methods of detecting it.

Particularly interesting to the industrialist is the chapter "Principles of Illumination" which tells about increase in productive efficiency traced directly to better vision. When the U. S. Public Health Service carried on a series of tests in the Post Office Department, it was found, the report states,

> . . . that increasing the illumination from 2.7 to 10.7 foot-candles resulted in an increase of about 8 per cent in the number of pieces of small mail which could be sorted. . . . Investigations by Dr. M. Luckiesh indicate an increased speed of 15 per cent in reading ordinary printed matter for an increase of illumination from a value of 4 to a value of 16 foot-candles. For black print on gray paper the increase in speed was 50 per cent.

Discussing quantity, color, glare, and diffusion of light, the report sums up the subject by saying:

> Among the advantages of good lighting in work places are greater accuracy of work, less eyestrain, increased production, less wastage, increased efficiency because of the greater ease with which work can be supervised, better order and cleanliness, and a reduction of accidents. A psychological effect may also be obtained through more cheerful surroundings due to good lighting, resulting in greater contentment and cheerfulness among workers.

The concluding chapter deals with Light Codes.—Policyholders Service Bureau, Metropolitan Life Insurance Co., N. Y. (1931).

Tests Prevent Lead Poisoning—During the 10 months ending with September, 1,040 blood tests for lead poisoning had been made in the Chicago branch of the diagnostic laboratories of the Illinois State Department of Public Health. Up through May, from 36 to 57 per cent of the tests made each month indicated marked absorption of lead on the part of the individual from whom the blood specimen was taken. This indicated that he was on the way to physical disability from lead poisoning.

Beginning with June the percentage showing a high degree of absorption has declined sharply. Of the 117 tests made in September, only 16 or 13.6 per cent showed a marked absorption.

Shifting employees to different jobs caused the change. Employees who were found to be absorbing lead at a significant rate were shifted to jobs where the exposure to lead poisoning was less or altogether absent.

This experimental work was made possible by the coöperation of a group of industrial physicians. Certain employees were chosen for the tests. Employment was shifted in cases that seemed to indicate the desirability of this procedure. The change in the tests suggests that this procedure was effective.—*Illinois Health Messenger*, 3, 21: 83 (Nov. 1), 1931. E. R. H.

CHILD HYGIENE

A STATE DIVISION OF INFANT AND CHILD HYGIENE

THE logical development of a Division of Child Hygiene in a State Board of Health is well exemplified in Indiana. Prior to 1919 sporadic attention was given to child hygiene, but in that year growing interest in the child culminated in the establishment of the Division of Child Hygiene. From the very first a comprehensive plan of organization was followed. The child hygiene work in that state has developed consistently year after year under the same general direction.

In July, 1922, federal assistance, under the Sheppard-Towner Act, was made available. For 7 years the Division of Child Hygiene carried out a consistent program that reached every county and township in the state. When the federal subsidy ceased, the momentum created by widespread health education and trained direction of child hygiene carried the activities through 3 trying years with but little slowing-up.

The administration of the Indiana Division of Infant and Child Hygiene has been under the able direction of Dr. Ada E. Schweitzer. The personnel of her Division consists of:

Office:	1 secretary
	2 stenographers
	1 artist-stenographer
	1 statistician
Field Physicians:	5 field physicians
Field Nurses:	6 field nurses
Field Assistants:	5 field assistants

ACTIVITIES

The following health educational programs have been conducted:

1. County-wide child health conferences have been held for examination of infants and preschool children and for consultation with parents who bring their children to some central place in each community. Supervision by the family physician is advised and a parents' report card contains findings of the child hygiene division physicians. Routine advice concerning diphtheria, smallpox, and typhoid immunization is given. Special requests for examinations in one or more places in a county were granted if possible. One series of well baby clinics was conducted to demonstrate the value of periodic examinations.

2. A 5-period course in maternal, infant, and preschool care and in adolescent problems has been offered to adults, chiefly women, and to high school boys and girls. Lectures and demonstrations on growth and care of children were given to girls and women. The films reviewing the course were also shown to the young men.

3. Correlation of community health programs was encouraged. Assistance was given in planning programs.

4. Exhibits including poster groups, table displays, and pamphlets and books were available on request. A special exhibit was prepared for the American Public Health Association and one for the American Medical Association, and for the State Medical Association and State Health Officers Conference, the State Parent-Teachers, Federation of Women's Clubs, and many other national, regional, state, and local associations.

5. Motion pictures were planned for meetings of state and local organizations, for schools, churches, and clubs, and for other local programs.

6. Lectures and practical talks were given on growth and care of children.

7. A weekly health education talk was broadcast from station WFBM, one talk from station WKBF, and two from WLS.

8. Gorgas Memorial Association feature articles were prepared for publication.

9. Health projects were planned in personal conferences.

10. Programs were prepared to be carried out by state-wide groups.

11. Health pamphlets were distributed.
12. Special projects designed to instruct large groups, as the parent education program at Winona Lake, the State Fair better babies demonstration, and college classes, were conducted.
13. Staff schedules and state-wide Child Health Day programs were organized.

GENERAL WORKING PLAN

"Wherever possible county and township chairmen assisted in organization for any type of activity. They were selected from groups having county-wide organization. Local health officers, nurses, physicians, school officials, and lay groups usually assisted the state child hygiene workers."

Each field staff organizes and conducts conferences, classes, and other health projects. Special organization is planned for such activities as Child Health Day, state fairs, and parent education institutes.

The major activity for the year 1929–1930 was the child health conferences, in the preparation of which the field staffs visited 35 counties and 190 towns.

EDUCATIONAL PROGRAM

"The most outstanding part of the educational program, the class instruction to women and to high school girls and boys, includes lectures by a child hygiene physician, demonstrations by the child hygiene staff nurse, and exhibits of health posters and charts, and motion pictures.

"During the past year this instruction has been given largely to high school girls, with suitable health films for boys, who have shown a splendid attitude and much interest. Always the work is adapted to the type of group receiving it. The high school girls ask questions, take notes, and are generally alert to all that is offered them."

The annual reports of the Division of Infant and Child Health are replete with valuable suggestions and analyses of extensive data.

PRENATAL CARE

The studies made of examination records by members of the staff reveal conditions which should interest every health official. For example, a history of prenatal care, based upon the records of 7,311 women who brought children for examination to county conferences, showed the following:

22.0 per cent had no prenatal care
3.4 per cent had 6 weeks or less
24.0 per cent had 6 weeks to 6 months
50.5 per cent had 6 to 9 months

"A study of the percentage of women who had abnormal labor would indicate that many women consulted their physicians because of abnormal conditions and that many others did not consult physicians because no alarming symptoms appeared. At any rate, the highest percentage, 91.7 per cent, reporting normal labor appears in the group having no prenatal care."

IMMUNIZATION

"The proportion of children immunized to one or more diseases is improving. Last year histories of children examined showed 1 in 5; this year the ratio is 1 to 4.5. These are chiefly preschool children who are brought to county child health conferences for examination. Indiana parents generally do not as yet understand the importance of diphtheria immunization under 1 year."

PUBLIC HEALTH NURSING*

The Hospital Nursing School and Economics—Cost studies of nursing schools are coming in to the Grading Committee. Of 111 hospitals which figured what it would cost them to give up their schools, 19 would save money, 92 would lose money. In this study, for every 10 students let go, 18 per cent of the hospitals would need (plus maids and orderlies) 0–3 registered nurses; 19 per cent would need 4; 28 per cent would need 5; and 35 per cent would need 6 or more registered nurses. If giving up their schools, 40 per cent would reduce the teaching and supervisory staff; 50 per cent retain the same number; and 10 per cent would add to their number.—Take Out the Profit, *Am. J. Nurs.*, XXXII, 1: 54–55 (Jan.), 1932.

In this connection it is interesting to note that a letter from J. C. Geiger, M.D., Health Officer for the City and County of San Francisco, Calif., to the American Public Health Association, states that on January 1, 1932, the San Francisco Hospital closed its nursing school and thereafter would employ only graduate nurses to care for its patients. Dr. Geiger writes:

> The Committee on the Grading of Nursing Schools has found that the number of schools and the number of graduate nurses is out of all proportion to the public demand. The Department of Health, in closing its undergraduate school of nursing, has been mindful of the overproduction of nurses, with their resultant unemployment and has welcomed the opportunity to assist in adjusting this economic situation.
>
> In opening the hospital to a postgraduate school of nursing the administrators feel that a definite contribution will be afforded the community by the opportunity offered for advanced training in the special fields which are available at the San Francisco Hospital. Advanced courses in children's diseases, maternity, operating room technic, tuberculosis, and communicable diseases, are now outlined with the development of special courses in ward administration, genito-urinary diseases and psychiatric nursing proposed for the near future.

Do You Know What an Hourly Nursing Service Is?—Nurses themselves have been responsible for the hourly nursing service movement because it seems to offer one solution of the problem of how to reduce the cost of illness. Yet despite the fact that this service is badly needed in most communities, and is available in many urban communities and in some towns, and even in rural centers, it is growing rather slowly in popularity. Either patients do not know about it or no one remembers to suggest it.

An article by Miriam Ames in the December, 1931, *Hygeia,* entitled "Fifty Ways to Use the Hourly Nurse," explains this service so clearly and completely that the American Nurses Association, 450 Seventh Avenue, New York, has had reprints made which can be obtained from their office at a cost of 5 cents each. There ought to be a big run on these pamphlets.—Miriam Ames, Fifty Ways to Use the Hourly Nurse, *Hygeia,* IX, 12: (Dec.), 1931.

Public Health Nursing in New South Wales—New South Wales is the oldest Australian state. Its area is somewhat greater than that of Texas and its population about half as large.

In 1912 there was only 1 trained nurse employed in public health work in New South Wales; there are now 215, including those employed by the gov-

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

ernment and by private or unofficial agencies.

Nurses Employed by Official Agencies—The Department of Infant and Maternal Welfare employs 111 nurses with a supervisor.

The Tuberculosis Division of the government employs 2 trained nurses who have also the certificate of the Royal Sanitary Institute.

The Department of Education (Medical Branch), under the direction of the Medical Director of Education, employs 13 nurses.

Nurses Employed by Unofficial Agencies—There are 41 Bush Nurses scattered in different parts of New South Wales—the organization which finances them receives a small government subsidy.

The District Nursing Association, which is supported by private subscription and subsidized by the government, employs 12 nurses who visit the sick poor in their homes.

The Royal Prince Alfred Hospital has 2 nurses who visit tuberculosis patients. The Fenwick Hospital employs 6 visiting nurses, and the children's hospital 1.

The Lactogen Company employs 1 nurse.

There are 5 nurses employed by the Plunket Association, who give advice to mothers according to the teaching of Sir Truby King, under the direction of a supervisor.

There are 17 industrial nurses employed by private firms.

Dr. J. S. Purdy, M.D., Medical Officer of Health for the Metropolitan Combined Sanitary Districts, with headquarters in Sydney, is studying and seems to be very much interested in generalized public health nursing services in other parts of the world. He has a keen grasp of what this type of a service could mean for he writes:

> General public health nursing in contradistinction to "specialized" nursing, means simply that nurses are assigned to general nursing work of all kinds in small districts instead of being assigned as individuals or groups to special nursing activity on a city wide basis. Generalized nursing in its broadest sense includes not only instructive nursing but bedside nursing as well. It is difficult to separate instructive nursing from bedside nursing because in many cases the success of the health nurses' effort to instruct and advise is contingent upon her helpfulness in actual care of the sick patient. When a member of the family is sick, the nurse who is prepared to do something tangible for the comfort of the patient is better able to get a hearing on other health matters. It often happens that her success in preventing disease depends on her care and management of the individual during illness.
>
> The natural tendency in the organization of health nursing activities is toward specialization of nursing assignments in various fields of communicable disease work, school health work, prenatal work, infant welfare work, etc. Although the nurse specialist acquires a technical skill in dealing with these special activities which she could not acquire if her duties were of a more general character, specialization in public health nursing tends to considerable overlapping and duplication of work and prevents the nurse from acquiring a well rounded view of the many sided problem of community health. Then, too, the nurse should be a public health nurse instead of a communicable disease nurse or a tuberculosis nurse, child welfare nurse, or what not, for as a knowledge of public health needs has grown, it has become apparent that to deal effectively with the individual "case" of sickness the health visitor must be capable of dealing with a great variety of related problems in the home.

—"Nurses Employed in Public Health Work in the State of New South Wales" and "Generalized Public Health Nursing," by J. S. Purdy, M.D., Medical Officer of Health for the Metropolitan Combined Sanitary Districts of the State of New South Wales.

EDUCATION AND PUBLICITY*

Is There a Plan?—The wide range of press release topics issued by different states during the same period is quite puzzling. To a degree they reflect department programs, but that does not fully account for the diversity.

Are there plans for a progressive development of subject matter, with due allowance for seasonal topics and emergency matters?

Are press releases accompanied in some states by corresponding plans for other forms of presenting the same topics?

Are meeting topics offered to local groups? Suggestion of the press topics for use by speakers?

Are there plans far enough ahead so that local meeting programs could be planned for the weeks when certain topics are to be presented in the newspapers?

Are such plans desirable? Are they practicable?

Are such questions as the above worthy of detailed consideration by state and local health workers?

Says *Mind and Body* in a recent issue:

> Teaching without a program is like sailing a boat without a compass—one just goes without knowing where.

They Are So Varied—Omitting releases on departmental activities or announcing or reporting meetings, here are the topics of material supplied recently to the newspapers by state and national departments of health:

Connecticut: "Survey of Indoor Pools"; "Can Smallpox be Controlled by New Year?"; "Conserving Eyesight"; "Smallpox Again"; "Smallpox Vaccination Necessary"; "Christmas and New Year Greetings"; "Health Officials Concerned in Protection of the Public Health."

Iowa: "Christmas Greetings" (to editors, nurses, teachers, and organizations); "Christmas Presents" (diphtheria prevention); "Trichiniasis"; "Opportunities—And Resolutions"; "From Pail to Palate"; "Tularemia"; "Dangers Associated with Decreased Appropriations."

Maryland: "Read the Labels" (on holiday food flavorings); "Christmas Presents" (diphtheria immunization); "Regulations in Regard to Anti-Freeze Mixtures"; "What They Do" (bacteriological laboratories); "Last Year's Record"; "Facts and Fallacies" (mouth hygiene); "The Maryland Family"; "What and When and Why" (paragraphs of public health news); "Tune In on Station KYH" (Keep Your Health).

New York: "Leisure and Health"; "Pneumonia a Preventable Disease"; "Trends in Mental Disease"; "Football and Health"; "Athlete's Foot"; "Climate and Tuberculosis" (all radio).

Oregon: "Pneumonic Danger"; "The Double-Barred Cross of the Christmas Seal"; "What is a Public Health Nurse?"; "Contagious Sores." Every weekly press release is accompanied by tabular "Report on Communicable Diseases" (no comment). "Moist Air Necessary for Health"; "Immunize Early Against Spotted Fever"; "Every County and City Needs a Health Department"; "Hand Washing and Communicable Diseases."

Virginia: "Cleanliness in Surgery" (radio).

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* Please address questions, samples of printed matter, criticisms of anything which appears herein, etc., to Evart G. Routzahn, 130 E. 22d St., New York, N. Y.

U. S. Public Health Service: "Health Conditions in the United States" (1930–1931); "Prevention of Cancer"; "Present-Day Problems of Yellow Fever"; "Health Conditions Throughout the World"; "Items of Historical Interest Relative to Pellagra in the U. S."; and the following broadcasts: "The Care of the Teeth"; "Public Health Nursing"; "Starting the New Year Right"; "The Health Problem of the American Negro"; "Remarkable Remedies from the Endocrine Glands."

Is Any Department Too Small?—Too small and lacking in funds to get out its own house organ or health bulletin? The spread of mimeographed bulletins suggests that a department or other health agency need not be without a bulletin *if it has something to tell the public in that form.*

In small cities and towns, especially, so much can be asked of volunteers. We know of bulletins of welfare agencies which are mimeographed in some business office without cost. Volunteers may be secured for the folding and mailing. The actual cash outlay could be limited to postage, envelopes and mimeograph paper. Ready-stamped envelopes will reduce cost and labor.

Possibly the important question to be settled is: "Have we anything to say which could be said better through our own bulletin than through the newspapers?"

Uniformity with Variety in Reports—What Illinois has been trying:

> Before the preparation of the annual report for 1930–1931 of the divisions of the Department of Public Welfare was started, the department called together a committee of managing officers for the purpose of outlining a plan which would produce a better standard of report. . . . The committee were unanimous that a hard and fast outline which every institution would be required to follow should be avoided. It was the opinion of all that each institution should have latitude to express itself. At the same time, it was felt that there was certain information common to all institutions of the class, which should appear in the annual reports. Accordingly the committee set up those subjects on which each institution should be expected to make a report. Among these were: movement of population and personnel; medical department; research and education; occupational therapy; recreational therapy; diet; dentistry; nurses; attendants; paroles; farm, garden and dairy; schools; repairs and improvements; cemetery; and recommendations.

How to Select Posters for Classroom Use?—A revised edition of Some Posters on Child Health (American Child Health Association, 450 7th Ave., New York. *Free*) says:

> When selecting published posters for the schoolroom, consider these points:
>
> Will they be of assistance to the teacher and to the child in initiating activities?
>
> Are they of sufficient interest to the child to affect his behavior?
>
> Will they increase his understanding of healthful living?
>
> The most effective use of a poster is as an illustration of some definite health lesson, or as a stimulus to the practice of a health habit that has already been discussed. Simply to hang a poster on the wall and expect it of itself to bring about an improvement in health practices, is to ask too much of the poster or the child.
>
> Probably more effective than any printed posters are the ones worked out by the children themselves as an expression of the health ideas they have formed.

Undated Publications—For libraries, for students, for writers, and for other readers it is often important to know the date of a publication. And frequently the date is of first importance and so should be easy to find. Here is an important statement on "The Care of Mental Defectives in New York State." *At what date?* Half way through we find "(in 1929)"

—which may or may not indicate data suitable for a given purpose.

Please date your printed matter—at front or back—for the sake of your readers, or some of them.

Average Attendance of 2,000—That is the record of the first series of public lectures given by the Health Education Foundation of the Cleveland Academy of Medicine. A nucleus of $10,000 was provided by the Academy.

When recommending the Foundation the Committee on Health Education cited the following possibilities:

1. To apply scientific research to present health education methods and material to test their worth and effectiveness.
2. To provide public health lectures, carry on publicity in the interest of health through paid space in publications, through radio broadcasting, through group or individual instruction, and through other means as conditions may warrant.
3. To acquaint the public with all the advantages the community offers in the way of caring for the sick and the prevention of disease.
4. To seek to increase observance of the laws, ordinances and statutes affecting public health.
5. To urge the adoption and enforcement of legislation in the interests of health.
6. To advise the public against exploitation.

The *Bulletin* of the Academy (April, 1931) says:

Criticism has been aimed at much of the health education propaganda in the past. Much of the criticism has been based on ignorance, but some has been justified. Probably, the two greatest failures have been lack of intelligent direction and lack of funds. As the *Plain Dealer* phrased it, Health education has been the "Orphan Annie" of many institutions. Being merely an adjunct of larger programs (usually service programs), it has received short shrift as far as the dollars available are concerned.

The Foundation is, so far as we know, the first attempt to put health education on an endowment basis. There are, of course, endowments for specific fields of activity, but none solely for the study and propagation of education in the active field of public health. Therefore, its importance is more than local.

The Ability to Plan—Says Dr. J. Mace Andress:

The ability to plan is one of the first qualifications of a health educator. What are your most pressing needs in health education? What plans will you formulate for the New Year?

Dr. Andress urges extensive health education planning, by school systems, by single schools, by individual classrooms.

How a plan may be directed at a simple objective is illustrated:

Let us suppose that the prevention of colds is to be the goal of a health program in a certain school. This is an illness that leads all others in most schools. The principal or health teacher who is to initiate this program should first get the coöperation of the teachers, school doctors, school nurses, and parents. A program if it is successful should be understood and approved by all those who come in contact with the children. It might be well to have the whole matter brought up before a parent-teacher meeting. Coöperation of the parents is especially necessary in this project, since most colds are communicable; children should be encouraged to stay at home at the onset of a cold. More sleep, rest and attention to hygienic living are desirable. These are not to be gained ordinarily unless parents and children work together. Through health teaching the school may hope to guide and motivate children in the right way.

Although the prevention of colds may seem at first to be the only objective it is easy to see that the carrying out of such a program would involve almost every aspect of healthful living. Although there is still much to be learned about colds it is obvious that we know enough so that with united efforts they cannot only be reduced but those contracted may be less serious.—

Should We Adopt a Five Year Program for Health Education? *Hygeia,* Chicago. Jan., 1932. *Sample free.*

Single Samples Only—Sample copies are usually available, but readers will be disappointed if they ask for quantities of material issued by state and local agencies.

If you want more copies it is safe to ask the price.

Many Questions Answered—To help answer letters of inquiry from teachers, public health workers and others a group of tentative memoranda has been prepared and is being submitted for criticism and suggestion. Copies of the tentative memoranda will be sent to those who will promise to write out their criticisms and suggestions. When issued the revised editions will be offered to all who care for them. Here are some of the titles:

Sources of information on health education problems and methods in elementary schools; health education: free material for distribution to pupils; posters: hand-made or school-made; posters: in school health education; plays: health; marionettes: puppets.

Thin Ice—Leaders in the nursing profession have been aroused by the use of the uniformed nurse in advertisements, and direct testimonials for merchandise signed by nurses. "New Ethics in Publicity," by Meta Pennock, A.B. (*Trained Nurse,* 468 4th Ave., New York. Dec., 1931. 35 cents) is illustrated by numerous advertisements in which the nurse is featured.

Strange as it may seem in 1932 there was a time when the medical profession—

and the nurse interpreter kept their wisdom to themselves with the idea that science was much too complicated to be interpreted to the lay mind—and at times the accompanying idea that if this knowledge were common property they would have less standing professionally and less profit financially. . . .

Swept in by the public health group came the new attitude—that the teachings of science should be reduced to their simplest terms so that all might apply them with the degree of understanding which each possessed. From this standpoint all the sound information on health habits and healthy living which can be conveyed through advertising in magazines, on the radio, or in the writings on the sky is that much benefit to the public. Carried on this tide of helpfulness and freed from the narrow-shouldered type of ethics of the previous generation, the physician has stepped out of his office into the public forum. The nurse, who is his interpreter and his extender, has followed suit, and is showing by precept and practice how science may be applied for the prolongation of life and for its enrichment. . . .

Miss Pennock discusses the dangerous situation when a nurse gives a health talk on time purchased by an advertiser.

First she should ascertain from reliable sources the standing of the organization under whose auspices she is asked to speak.

A list of the sources of information follows with a reminder to consult—

local scientists in good standing—doctors, health workers, public health nurses and others as to the content of the address to be delivered.

The nurse's responsibility to the public and to her profession forbids her to include—

any endorsement or testimonial of the product or products of the manufacturer or dispenser who sponsors the broadcast. She must also exact the promise that she be permitted to read in advance and approve of every word of the announcer or continuity speaker who carries the program with her. This prevents her talk from being coupled with unwarranted or exaggerated claims for the product and avoids the possibility of giving the impression that she endorses the organization or its products.

The advice about giving testimonials is quite positive.

This question of written, spoken or implied endorsements or testimonials can be handled in but one way: Like that famous advice to those about to marry, the answer may be summed up in the one word, "Don't." European professors of medicine who are sorely in need of money to continue their researches may step out of their scientific frames to recommend yeast, antiseptics, or soap, but in America it "just isn't done." Good ethics throws down the challenge of placing the public in a vulnerable position.

Praise of the nurse-speaker is to be guarded against by careful examination of all introductory speeches.

With the permission of those organizations with which she is associated—the local hos-

pital, the local visiting nurse's association, etc., these connections may be mentioned because they tend to give the public confidence in the health information which she will impart. The university from which she obtained her general education and the nursing school from which she was graduated, as well as membership in professional or educational bodies, are also clews which the public seeks in its effort to measure the degree of authority or scope of knowledge of the person whose health advice is to be followed. She speaks, therefore, not as an individual but as a representative of every group mentioned and her responsibility as such a representative is thereby increased a hundred fold.

The article continues with a group of dilemmas faced by physicians, nurses and research workers, and how they met them. "Was this ethical, was this protecting the public?" is asked of each case.

These examples touch upon the writing of booklets and other material, both signed and unsigned. Miss Pennock draws her own conclusions, and points to the recently published code of the New York Academy of Medicine and the Medical Society of the County of New York as a further guide.

NEW

Better Times, long published as a miniature magazine record of health and social welfare in New York City, is now issued by the Welfare Council, 122 East 22d St. The page size is now larger; weekly news issues, with four magazine issues a year. *Sample free.*

By The Way, Health Education Division, Children's Fund of Michigan, 660 Frederick St., Detroit. Mimeographed bulletin.

New Mexico Health Officer, State Bureau of Public Health. 9 pp. Mimeographed.

HONORABLE MENTION

To Merrill-Palmer School, Detroit: For biennial report with both contents *and* index.

RADIO

Boston has been broadcasting over WEEI a series of conversations on White House Conference subjects. Frank Kiernan, Dr. Raymond S. Patterson and Dr. Lila Owen Burbank have exchanged questions, argued, agreed or disagreed via radio.

"Hydrophobia" and "Explorations in Nutrition" were recent topics broadcast by Dr. Haggard Sunday nights. *No charge* to receive printed copies weekly. Address Eastman Kodak Co., Rochester.

Present and Impending Applications to Education of Radio and Allied Arts is a revised edition of one issue of the Information Series of National Advisory Council on Radio in Education, 60 East 42d St., New York. Presents, intelligibly to the layman, the mechanical and other scientific conditions and problems in broadcasting, television and sound pictures; definitions of terms. *Free.*

Five-minute broadcasts on mental hygiene, 20 of them, with 8 on child guidance, are reprinted in Radio Talks on Mental Hygiene and Child Guidance. New York State Dept. of Mental Hygiene, Albany. 54 pp. *Free.*

The "world's biggest gymnasium class" is now directed over stations WEAF, WEEI, WGY, WBEN, WRC, WCAE, WFI, and CKGW. Daily, except Sundays and holidays, at 6:45, 7:00, 7:20 and 7:45 A.M. Self-Directed Body-Building Drills is 8-page illustrated folder supplied free by Tower Health Broadcasting Station, Metropolitan Life Insurance Co., New York.

Quite a series of mimeographed copies of broadcasts will be supplied by Bureau of Health Education, Dept. of Health, 139 Centre St., New York. *Ask for a list.*

Various radio talks are reproduced in *Monthly Bulletin,* Philadelphia Dept. of Public Health, *Connecticut's Health*

Bulletin (State Dept.), and *Pittsburgh's Health* (Dept. of Public Health).

Baltimore Health Dept., in collaboration with the Medical School of University of Maryland, has inaugurated weekly broadcasts over WBAL, Tuesdays at 6:15 P.M.

New York State Dept. broadcasts over WGY are now given on Wednesdays at 6:15 P.M.

DEPRESSION

What are the results of unemployment and depression conditions upon health, both now and in the future?

Please send your impressions, your observations, your fears.

Have you any statistical data, or are you planning to gather any?

"Do Hard Times Harm Health?" Notwithstanding the statistics as given out by Surgeon General Cumming, dare we ignore such statements of fact as the one given out by the United Hospital Fund of New York? *American Medicine,* New York. Nov., 1931.

"Unwise Economy to Curtail Health Services." Statement in *Health News,* New York State Dept. of Health, Albany.

This is a time when nutrition is again a news topic. Under the leadership of the Food Administration during the war, balanced diet and suitable food for various age groups was spread far and wide, using food saving as a peg on which to hang information. In the present emergency again, economical balanced diet is of major interest.

"Emergency Nutrition Special" of *American Child Health News* (clip sheet), 450 7th Ave., New York (Jan., 1932), gives material for house organs and other uses. *Free.*

"What best to do with an inadequate amount of money?" is answered simply and practically by H. C. Sherman, Columbia University, in *Child Health Bulletin,* American Child Health Assn., 450 7th Ave., New York. Nov., 1931. *Free.*

The Connecticut State Dept. of Health has reprinted the above as a 4-page folder.

Somewhat the same information is expressed even more simply and more graphically, in form for popular distribution in Getting the Most for Your Food Dollar. Bureau of Home Economics, U. S. Dept. of Agriculture, Washington. *Free.* Reprinted in *Red Cross Courier,* Washington. Feb., 1932.

"Food and Nutrition in the Depression Period." Editorial in *J. A. M. A.,* 535 N. Dearborn St., Chicago.

SPECIAL EVENTS

Ask for celebration material, addressing U. S. George Washington Bicentennial Commission, Washington Bldg., Washington, D. C.—if you wish to give a health angle to the celebration.

May Day–Child Health Day is not far away. For suggestions address American Child Health Assn., 450 7th Ave., New York.

National Negro Health Week comes April 3–10, 1932. Supplies need to be ordered quickly. Last year half the orders were sent in too late to print large enough editions. Posters and Negro Health Week Bulletin each sell at $1.25 for 100, $12.50 for 1,000. Order of Superintendent of Documents, Washington, D. C.

CONTESTS

Journal of the Outdoor Life, 450 7th Ave., New York, offers prizes for mystery stories. "Must be strictly mystery stories, not necessarily murder stories. . . . Tuberculosis must in some way be connected, though the setting may be anywhere." Closes April 1, 1932. *Write for details.*

Awards for essays and plays or pageants offered to schools of nursing and members of district associations by American Nurses' Assn., 450 7th Ave., New York. Closes May 1, 1932. *Write.*

Posters on fresh air are to be judged for prizes by Anti-Tuberculosis Society, 207 N. Centre St., Pottsville, Pa. The classification and rules will be *supplied on request*.

Hundreds of talks were prepared by high school students last year for the radio public speaking contest conducted by the Minnesota Public Health Assn., St. Paul. Nearly a hundred talks were selected in preliminary contests before high school assemblies. Ten talks, in the final contest, were broadcast by the students on consecutive days. A similar contest is now under way.

EDUCATIONAL

Educational effort among special groups often may prove more significant and far-reaching in its influence than some more appealing and even spectacular efforts to reach the general public. Other health workers, social workers, key men and women in the varied clubs, professions and other groups, make up some of these special audiences.

From month to month time may be taken to advantage for mailing a few copies of highly specialized publications to very carefully selected names.

Much of the material listed below is useful for such specialized educational effort.

Adequate County Health Organization, Tuberculosis Control and the Medical Profession (13 pp.); Medicine: The Tortoise—Why Pick on It? (equals 7 pp.). By D. D. Armstrong, M.D. Metropolitan Life Insurance Co., New York. *Free.* Reprints.

The Frontier Nursing Service, by Anne Winslow. Committee on the Costs of Medical Service, 910 17th St., N.W., Washington. *Free.*

Income From Medical Practice, by R. G. Leland, M.D. American Medical Assn., 535 N. Dearborn St., Chicago. Reprint. 24 pp. *Free.*

The Newer Aspects of Anti-Tuberculosis Work, by Iago Galdston, M.D. Address the author: New York Academy of Medicine, 2 East 103d St., New York. 11 pp. Reprint. *Free.*

Principles and Problems of After-Sanatorium Care, by Edw. Hochhauser. Address the author: Committee for the Care of the Jewish Tuberculous, 71 West 47th St., New York. 10 pp. *Free.*

The Coming Baby (22 pp.); The Care of Baby (34 pp.); Food—The Teeth and Health (30 pp.). Substantial pamphlets; simple illustrations—the third one with color. To be issued: The Pre-School Child. Dept. of Health, 139 Centre St., New York.

Smallpox and Vaccination: Information for Physicians. Connecticut State Dept. of Health. 8 pp. *Free.*

Your Emotions; Behavior Patterns; and 12 other 4-page folders. New York State Dept. of Mental Hygiene, Albany. *Free.*

Books for Parents, Teachers, Social and Public Health Workers; For Your Home Library; A Selected List of Social Hygiene Publications; Free Folders and Leaflets. American Social Hygiene Association, 450 7th Ave., New York. *Free.* Lists of publications.

The Prudential Insurance Co., Newark, N. J., offers booklets and folders on exercise, smallpox, diseases of children, food, tuberculosis, child health, first aid, common drinking cup, cancer, hiking, and "Our Babies." The last is the large illustrated pamphlet by Dr. H. N. Bundesen.

Safety and Simplicity in Infant Feeding; A Safer World for Babies. Evaporated Milk Assn., 203 N. Wabash Ave., Chicago. *Free.*

BOOKS AND REPORTS

Proceedings of the National Conference on College Hygiene—*Sponsored by the President's Committee of Fifty on College Hygiene, The National Health Council, The American Student Health Association. New York: National Tuberculosis Association,* 1931.

This report, just issued, is one of the most arresting which has come to our attention in a long time. In view of the fact that there are upward of 1,000,000 students in our universities, and that these are in a formative period of life, the importance of the subject may be appreciated.

The report does not lend itself readily to review, consisting as it does of reports by sub-committees which have been carefully edited and are succinct.

We may mention as outstanding features the conclusion that every college, regardless of size or resources, is under obligation to make arrangements for the protection, maintenance and promotion of the health of its students and the treatment of those physically or mentally sick or socially maladjusted. The educational purposes of a college are not adequately served when there is lack of arrangements for instruction concerning maintenance and protection of physical, mental, and social health. Tentative rules are given for the carrying out of these fundamental propositions. All college health teaching and physical welfare activities, including health service, physical education, and intercollegiate activities, should be conducted under one administrative unit, or equivalent. Among other procedures, the routine Wassermann test is advised. The common cold is a most important factor in morbidity, and should not be lightly considered as at present. Early and intensive treatment is required.

A special report was made on tuberculosis. A complete history of all new students, physical examination and routine tuberculin tests (Mantoux intradermal), with X-ray pictures of all giving positive reactions, which should be repeated if suspicious signs should appear, are advised.

It is held that it is a fundamental responsibility of a college to limit its use of the interest from its trust funds and other financial resources to the education of students whose intellect, health, and personality give reasonable assurance that the educational investment will not fail because of early incapacity or premature death.

We know of no publication which gives in so little space such a clear exposition of the underlying fundamentals of college health, the responsibility of college authorities, combined with putting an outline for the recommendations into effect. MAZŸCK P. RAVENEL

Examination of Water—*By William P. Mason and Arthur M. Buswell (6th ed.). New York: Wiley,* 1931. 224 pp. Price, $3.00.

This sixth edition of Professor Mason's well known textbook, *Examination of Water,* revised and enlarged by Professor A. M. Buswell, bears a worthy testimony to the esteem in which previous editions of this book have been held. Chapters are presented dealing with: (1) chemical examination of water, (2) routine laboratory methods for the estimation of mineral constituents, (3) laboratory exercises in water treatment, and (4) the bacteriological examination of water.

In revising the text, new methods, such as the determination of hydrogen ion concentration and the use of eosin methylene blue agar, have been incorporated; the wording and terminology in certain instances have been modernized; and the appendix has been extensively enlarged by adding, (1) standards for use in water analysis, (2) forms and tables of value in water purification work, and (3) drinking water standards of the Treasury Department for drinking and culinary water supplied by common carriers in interstate commerce.

To a great extent the spirit and characteristic wording of the original text have been retained. The book is not intended for the research worker or graduate student but rather for the undergraduate who is being introduced to the subject for the first time. Apparently for this reason considerable space is devoted to the citation of experiences and definite illustrations which provide an educational background for the student. This tends to create a more intense interest in the analytical procedures described.

As frequently happens in first printings, an occasional error appears: for instance, the term "chlorine" when chloride is intended has been correctly changed to chloride in the text—a corresponding change was not made in graphs; on page 150 the specification for the sterilization of glassware is given as 170° C. for 1½ hours, while an illustration on the facing page suggests 170° C. for 1 hour; and the page heading of eosin methylene blue agar is carried from pages 151 to 161 although it applies only to one page.

C. T. BUTTERFIELD

A Short History of Nursing—*By Lavinia N. Dock and Isabel Maitland Stewart (3d ed.). New York: Putnam,* 1931. 404 pp. Price, $3.00.

Probably there are few graduate nurses today who did not study either Nutting and Dock's large *History of Nursing,* or Dock and Stewart's *Short History of Nursing* while in nursing school. Both are classics in the nursing world. The *Short History of Nursing* has been completely revised. In it the newer trends in the nursing school curriculum and the changing points of view in the teaching of history are considered. The volume is written primarily for the use of students in the nursing schools of the United States and Canada and is designed as an introduction to the social and professional aspects of nursing. It is hoped that it will have an ever-increasing use among students of general history in high schools and colleges, as there is probably no more dramatic or moving story anywhere of the life saving adventures of the race than can be found in the long line of nursing pioneers who shared in many of the episodes of world history and who led in some of its most constructive movements.

The backgrounds and foregrounds of nursing have been painted with a broad sweep, and only enough dates and names have been left in to trace the sequence of events. The main emphasis has been placed on influences, issues and trends in nursing, and, after all, this is what most of us wish to get when we read history. It is very satisfying also to have all sentiment laid aside and these influences, issues, and trends, interpreted clearly, sanely, and without bias.

The first part of the book is essentially the same as in the older editions, but the last chapters, in which the authors show how modern nursing came to other countries, and describe the movement for self-organization, the widening field of nursing service and, finally, the future nurse, her heritage and trust, is all either new or old material which is interpreted in such a new and refreshing way that we nurses who have been living and working contemporaneously with these changes and trends

find a great deal of new information and feel a new thrill of accomplishment in reading them.

At the end of each chapter is a list of suggested reading so that one may delve more deeply into the history of nursing if she wishes—indeed she is encouraged to do so. In the appendices there is a fine list of reference books for teachers and students, and other valuable material pertinent to nursing is included. There is a good glossary and index. The ingenious maps and original drawings by Jessie H. Stewart delightfully and effectively assist in interpreting and reinforcing the text. This is by far the best short history of nursing on the market and can be recommended without qualification.

EVA F. MACDOUGALL

Nutrition and Food Chemistry—*By Barnard S. Bronson. Wiley,* 1930. 467 pp. Price, $3.75.

The modern teacher of nutrition finds some difficulty in the selection of a text or texts for his students. He needs a descriptive text which will deal adequately with the chemistry of the foods and the chemistry of their digestion and assimilation. He needs an adequate treatment of the vitamins and their rôle in nutrition. He needs further a text which will discuss the nature of current food offerings, how they are made and how their manufacture affects their nutritive value.

His students on the other hand find the problem of maintaining a library of texts to cover this range of subjects somewhat of a financial burden.

Both teacher and student will find in Bronson's *Nutrition and Food Chemistry* a happy solution of their mutual problem in one volume. Dr. Bronson has happily combined the above features in his new text. He has made excellent selection of essentials in all the fields and expressed them in a language that is simple and clear. He has not condensed or abbreviated where detail of exposition is necessary, but he shows a full appreciation of what is essential. I find his text one that it is a pleasure to recommend to any student of nutrition regardless of whether his interest is in the scientific or the applied phases of the subject.

WALTER H. EDDY

Ohio Conference on Sewage Treatment, Fourth Annual Report, Dayton, Ohio, October 16–17, 1930.

The fourth annual conference on sewage treatment was held at Dayton, O., October 16–17, 1930, and drew an attendance of 104.

Papers presented were on the Dayton sewage treatment plant, by M. W. Tatlock, a detailed description of the pumping equipment, mechanical treatment devices, operation and gas collection and utilization; experiences with industrial wastes at the Fostoria sewage treatment plant, by A. B. Cameron, a very long and complete paper describing the sewage treatment plant, the operation, the wastes present in the sewage, including amorphous carbon, oil and grease, ferrous sulphate and sulphuric acid, remedial measures employed, rehabilitation and improvement of the plant; discussion of problems in other Ohio cities caused by presence of industrial wastes in their sewage; Some Observed Effects of Dilution in the Self-Purification of Streams, by J. K. Hoskins, covering results of observations made by the Stream Pollution Investigations Station, U. S. Public Health Service, Cincinnati, on the Ohio River and tributaries, the Illinois River, and others; Relation between Design and Operation of Sewage Treatment Works, by Robert A. Allton; and Some Observations on the Design and Operation of Sewage Treatment Plants for Country Clubs and Private Estates, by R. F. MacDonald.

VINCENT B. LAMOUREUX

Simple Lessons in Human Anatomy—*By B. C. H. Harvey, M.D. Chicago: American Medical Association,* 1931. 434 pp. Price, $2.00.

This is the publication in book form of a series of articles which appeared originally in *Hygeia,* the magazine published by the American Medical Association. There has been some revision, largely by the introduction of additional material and illustrations.

The book is divided into 20 chapters covering, in simple words, the anatomy, construction, and relationship of the various parts of the organs of the body. The material is written in a clear and interesting way, and is made even more interesting by the insertion, wherever it seems necessary, of some material on embryology, showing how the various structures originated and also some material on the hygiene of certain parts. There is a very interesting chapter discussing briefly the structure and function of the endocrine glands. The final chapter is on cell division.

Numerous clear and instructive illustrations greatly increase the value of the book.

The book was designed and written for the use of the layman. For him it is very valuable and interesting material. It enables him to get a fairly definite concept of the growth and structure of the human body in a relatively short time.

CHARLES H. KEENE

Living the Liver Diet—*By Elmer A. Miner, M.D., with Introduction by William P. Murphy, M.D. St. Louis: Mosby,* 1931. 106 pp. Price, $1.50.

This book is prepared for the guidance of pernicious anemia patients. In the foreword the author states that he has written it from the viewpoint of both physician and patient. It is a handbook on the liver diet, and presents in detail its preparation and service. The 12 chapters are: the liver diet outlined, liver, fruits, meats, vegetables, fats, sweets, starches, milk, seasoning, drinks, and the diet maintained. The directions will serve for those with little knowledge of food to follow implicitly the Minot-Murphy diet.

Numerous directions are given for the preparation of liver so as to increase its palatability, and for the preparation and serving of the different foods discussed in the several chapters. The book will be extremely useful to those who must follow the dietary regimen imposed by the pernicious anemia patient.

E. V. MCCOLLUM

Allergy—A Handbook for the Physician and Patient, on Asthma, Hay Fever, Urticaria, Eczema, Migraine, and Kindred Manifestations of Allergy—*By Warren T. Vaughan, M.D. St. Louis: Mosby,* 1931. 359 pp. Price, $4.50.

Dr. Vaughan has given us a comprehensive handbook on allergy in its protean aspects, based upon his own experience and a careful sifting of the literature on this intriguing subject.

The book first describes what allergy means and how it affects the individual. The chapter on Allergic Equilibrium is especially enlightening and gives one a clear picture of the interaction of specific and nonspecific factors in the production of allergic symptoms.

Part II presents a complete list of allergens and antigens with the botanical and common names of pollinating plants. The chapter on geographical locations of the most important plants causing hay fever is well illustrated and proves very helpful in locating offending pollens.

A discussion of practical methods of diagnosis follows. A detailed questionnaire for inhalant allergies aids in differentiating an allergic from a non-allergic illness. The part dealing with therapy will be read with profit by physician and patient alike. Food avoid-

ances, food groups, elimination diets, physiologic readjustments, vaccine therapy, etc., are all discussed thoroughly.

Part V deals with prognosis and Part VI gives the manifestations of allergy and describes in detail the symptoms which may be associated with it.

The book concludes with a consideration of applied immunology, and an extensive bibliography.

This book can be heartily recommended as a practical, concise, and authoritative statement on allergy and its manifestations. RICHARD A. BOLT

Eye, Ear, Nose and Throat Manual for Nurses. *(2d ed.) By Roy H. Parkinson, M.D. St. Louis: Mosby.* 223 pp. Price $2.25.

Dr. Parkinson's manual has the virtues of simplicity, clarity, and brevity. The book is divided in three parts. The first, constituting nearly two-thirds of the total, is the outgrowth of a series of lectures given in a training school for nurses. The treatment is moderately uniform. Chapters I, II and III, devoted to the throat, nose and ear respectively, give anatomy and physiology of the organ considered, followed by common diseases and treatment, and a few suggestions on nursing care. The general rules for post-operative care of tonsil cases are so well given as to make helpful reading for the young nurse so often assigned to the nose and throat service before she has had her class work on the subject.

Chapters IV–VII deal with the eye in such detail as to convince the reader that this is the writer's field of major interest. In Chapter VII there are photographs illustrating procedures described, a method so effective that one regrets that it is used but twice in the textbook. Chapter VIII is a miscellany of suggestions chiefly on nursing care which might well have been distributed among the preceding chapters at the points of logical relation.

Part II, *Operating Room Technic,* could be used in part in teaching or as reference reading for student nurses preceding service in the operating rooms. The lists of instruments for each operation and the labelled photographs would prevent much of the confusion and discouragement frequently afflicting the student in her first days of duty. This section could have been improved by a brief statement of the steps in each operation. Too often the nurse has only a vague idea of what the surgeon is doing and her efficiency suffers thereby.

Part III is planned "to be an aid to the school nurse as well as to the district nurse in solving eye, ear, nose and throat problems which come to them." While it contains many good suggestions it is scarcely adequate for this purpose, though well adapted to the needs of a student nurse in her public health nursing class.

The manual is easy to read, the paper and type are well selected, and the style is simple. There are faults in diction and the indexing is incomplete. The questions appended to each chapter might help the student test her own understanding, but are not of the type used by teachers trained in present-day educational methods. There are no references.

The reviewer would recommend the book for reference in the library of any school of nursing. The advisability of adopting it for a given school could only be determined by comparison of the texts available, and consideration of other factors peculiar to the individual situation.

HAZELLE BAIRD DOUGLAS

Social Work Year Book—*By Fred S. Hall and Mabel B. Ellis. New York: Russell Sage Foundation,* 1930. $4.00.

The Russell Sage Foundation has undertaken the biennial publication of

a book which gives the progress of social work. This book is not intended to be an encyclopedia of social problems or social conditions. It does, however, outline in logical sequence the advance which has been made during the current year in the field of social service and public health, and frequently overlaps into the closely related professions of education and medicine.

This, the first volume of the series, outlines a background in which is presented historically the steps which have led up to the present status. The book has been prepared by special contributors who have worked under a supervisory committee. An attempt has been made to record recent events and developments including: first, laws passed on topics included in the volume; and secondly, reports collected by the leading social service organizations, community chests, welfare, health, and education divisions of the government.

There have been supplied over 400 laws and 2,300 reports collected on schedules covering 63 different fields of social work. The book contains also a valuable reference to all the national health and social agencies including the purpose and activities of each and the number who constitute its membership.

HENRY F. VAUGHAN

Occupational Disease Legislation. *Report of Committee on Standard Practices in the Problem of Compensation of Occupational Diseases, of the Industrial Hygiene Section, American Public Health Association—By Henry H. Kessler, Chairman. New York: A. P. H. A.*, 1931. 124 pp. Price, $1.50.

This report represents material which has been gathered since 1927 and condensed and revised to the current period. Both national and international authorities are agreed that occupational diseases should be compensated on the same basis as industrial accidents. The arbitration of claims, however, is much more difficult to settle, because diseases do not lend themselves so readily to interpretation and indemnification as accidental injuries. A proposal for legislative action concerning this situation should have for its basis the background of experience.

Beginning with a brief history of the extension of workmen's compensation laws to occupational diseases, the laws of some 15 European countries, Mexico, Central, and South America, and those of the British Empire are covered, often in tabular form. Then follow those of the Canadian Provinces, 7 of 9 of which have an enumerated list of compensable occupational diseases as well as state insurance funds. Compensation boards administer them.

For the United States, the provisions of workmen's compensation acts are quite completely discussed. These are of two kinds: The all-inclusive or "blanket" coverage law adopted by California, Connecticut, The District of Columbia, Hawaii, The Philippine Islands, Massachusetts, North Dakota, Wisconsin, and United States civil employees as well as longshoremen and harbor workers; and the specific schedule or list of diseases recognized as compensable, and adopted by Illinois, Minnesota, New Jersey, New York, Ohio, and Porto Rico.

A final section is devoted to annual reports of cases and costs in the various states and insular possessions of the United States. There is also a brief section on diseases resulting from, or aggravated by, accidental injuries, another upon medical and surgical care of injuries, and one upon the reporting of occupational diseases. A list of references and a very complete index follow.

This very timely compilation of occupational disease legislation and its results throughout the world should appeal especially to legislative and social agencies, employers, insurance com-

panies and labor organizations, and to all who are interested in improving or changing existing legislation to conform with modern progress and standards.

Much credit is due Eleanor Rantoul, a member of the committee, who gathered the original data and revised it in its present form.

EMERY R. HAYHURST

Fundamentals of Health—*By T. Bruce Kirkpatrick and Alfred F. Huettner. New York: Ginn,* 1931. 576 pp. Price, $3.80.

This is a textbook of hygiene intended to stimulate the interest and stir the imagination of college students by including subjects such as the genesis of life, phenomena of reproduction, growth and development, endocrinology and immunology. Each chapter is thorough in the treatment of its subject matter, with clear illustrations and a list of references appended for further reading.

Chapter I deals with the evolution of man, tracing the Crô-Magnon type upwards to *Homo sapiens*. At the end of this chapter the aim of the book is stated as indicating how the human body may adapt itself to an ever changing environment by judicious habits of living.

Chapters IV and V present an excellent account, condensed yet exhaustive, of foods and nutrition. In Chapters VI, VII, VIII and IX the anatomy and physiology of the muscular, circulatory, respiratory, and excretory human systems are outlined with practical examples of preventing common disorders of these systems.

An account of the nervous system is given in Chapters X and XI with a discussion of its adjustments and interrelationships with the internal secretions.

The book closes with a chapter on the public health, in which some of the tables require revision, e.g., the infective organism of typhus fever is wrongly stated in Table XXVIII but correctly in Table XXX and *Leptospira icteroides* is erroneously stated as the causative organism of yellow fever.

Sundwall (*Am. J. Pub. Health,* Jan., 1927) has emphasized that the subjects in a college course of hygiene should embrace a study of the factors governing health promotion and disease prevention and control. In Fundamentals of Health the authors have presented a concise account of the factors included in both these groups. A careful perusal of this splendid textbook will interest the student in personal and community hygiene. JOHN WYLLIE

BOOKS RECEIVED

MENTAL HEALERS. By Stefan Zweig. New York: Viking Press, 1932. 363 pp. Price, $3.50.

PSYCHOLOGY AND PSYCHIATRY IN PEDIATRICS. The Problem. Report of the Subcommittee on Child Health and Protection. New York: Century Co., 1932. 146 pp. Price, $1.50.

BODY MECHANICS: EDUCATION AND PRACTICE. White House Conference on Child Health and Protection. New York: Century Co., 166 pp. Price, $1.50.

SOCIAL PROBLEMS AND SOCIAL PLANNING. The Guidance of Social Change. By Cecil Clare North. New York: McGraw-Hill, 1932. 409 pp. Price, $3.50.

MEDICAL SUPERVISION AND SERVICE IN INDUSTRY. National Industrial Conference Board, 1932. 125 pp. Price, $2.00.

EXERCISE AND PHYSIOLOGY. By A. C. Gould and Joseph A. Dye. New York: Barnes, 1932. 434 pp. Price, $3.00.

CANCER. WHAT EVERYONE SHOULD KNOW ABOUT IT. By James A. Tobey. New York: Knopf, 1932. 313 pp. Price, $3.00.

THE CONTROL OF TUBERCULOSIS IN THE UNITED STATES. By Philip P. Jacobs. New York: National Tuberculosis Association, 1932. 407 pp. Price, $2.00.

THE STORY OF MEDICINE. From Medicine Man to Modern Physician. By Victor Robinson, 1931. 527 pp. Price, $5.00.

FEEDING A FAMILY AT LOW COST. Chicago: Evaporated Milk Association, 1932. 15 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Hourly Nursing—A brief account of an hourly appointment nursing demonstration in Chicago, a project of the Rosenwald Fund and a service with great possibilities.

AMES, M. Organized Hourly Nursing in Chicago. Pub. Health Nurs., 34, 1: 17 (Jan.), 1932.

Detroit's Diphtheria Study—Not to be missed is this excellent account of the epidemiologic study made of recent diphtheria cases in Detroit. The paper is too good to be spoiled by a partial summary here.

ANON. Diphtheria Studies in Detroit. City Health (Detroit Department of Health), 15, 4: 4 (Nov.–Dec.), 1931.

Diphtheria Immunization Results—In Philadelphia, 55 per cent of the preschool children and more of the school population have been immunized against diphtheria, the incidence of which has been reduced 80 per cent. Of the cases occurring, 99.3 per cent are among unimmunized children. Bacteriologically, the disease is as virulent as ever.

BAUER, E. L. A Survey of Diphtheria Prevention in Philadelphia. Am. J. M. Sc., 182, 6: 839 (Dec.), 1931.

Medical Graduates and Hygiene—Brief but illuminating comment on what candidates for medical licenses did with twelve questions on hygiene. None answered correctly the question: What is the sanitary code and by whom enacted?

BROOKS, P. B. Results of a Recent Hygiene Examination. New York State J. Med., 32, 2: 70 (Jan. 15), 1932.

More "Colds" Prophylaxis—The results of this experiment in the prevention of colds with vaccine show little if any improvement in the treated group compared with the control.

BROWN, W. E. Vaccine in the Prevention of the Common Cold: An Experiment. Am. J. Hyg., 40, 1: 36 (Jan.), 1932.

Whooping Cough Epidemiology—Intensive observation of whooping cough cases as they developed in a rural group constituted an excellent opportunity to study attack rates among contacts.

BURROUGHS, T. P. An Epidemiological Study of a Rural Outbreak of Whooping Cough. Quart. Bull. (Millbank Memorial Fund), 10, 1: 41 (Jan.), 1932.

Typhoid Fever—Typhoid carriers are still with us and will be for another quarter century. In the meantime, safeguards cannot be lowered and higher standards of personal hygiene must be maintained. A timely warning.

CUMMING, J. G. Should the Barriers Against Typhoid Be Continued? J. A. M. A., 98, 2: 93 (Jan. 9), 1932.

Hydrocyanic Acid—This brief discussion of the cutaneous absorption of hydrocyanic acid gas will be valuable to those who have to use this fumigant.

DRINKER, P. Hydrocyanic Acid Gas Poisoning by Absorption through the Skin. J. Indust. Hyg., 14, 1: 1 (Jan.), 1932.

Pasteurization in Canada—A Canadian symposium on pasteurization indicating that the Dominion sanitarians think with us, and not with the views on the subject expressed in journals published in England.

HARRIS, R. I., *et al.* The Menace of Raw Milk. Canad. Pub. Health J., 23, 1: 1 (Jan.), 1932.

Chlorine in Sewage—The practical uses of chlorine in disinfecting sewage, controlling odors, overcoming

other plant operation difficulties, and conditioning sludge are discussed.

GOUDEY, R. F. The Increased Use of Chlorine in Sewage Treatment. Municipal Sanitation, 3, 1: 10 (Jan.), 1932.

Smoke and Cancer—As a "horrible" example of fallacious juggling of crude statistics, this paper and its attendant discussion should be read by all who are tempted by the desire to prove a pet theory statistically. Smoke causes cancer, believes the author. For proof, she adduces such an irrelevant idea as this: the British housewife who cleans the soot from the grate and chimney pays the toll in breast and uterine cancer.

MUDIE, E. C. Air Pollution and the Rising Tide of Cancer. J. Roy. San. Inst., 52, 7: 292 (Jan.), 1932.

More Diphtheria Immunization—British experience is reported in which none of the immunized children is known to have contracted typical diphtheria.

NASH, E. H. T., and BOUSFIELD, G. An Immunization Campaign and Its Results. Med. Off., 47, 3: 25 (Jan. 16), 1932.

School Health Administration—Very practical is this discussion of the set-up and objectives of the school child health program, pointing out the many hurdles in the path to successful administration.

PERRIN, E. A Health Issue in the School Today. J. Health & Physical Ed., 3, 1: 15 (Jan.), 1932.

More Maternal Mortality—Another worth while contribution to the discussion about the accuracy of maternal death rates which suggests that the conditions are not as bad as the unanalyzed statistics would indicate.

RICHARDSON, B. K. Maternal Mortality. Illinois Health Quart., 3, 4: 258 (Oct.–Dec.), 1931.

Dental Defects and Sex—More boys among the younger children and girls among the older ones had decayed, missing or filled teeth. A very much greater percentage of boys than girls had marked decay and more girls than boys had filled teeth.

STOUGHTON, A. L., and MEAKER, V. T. Sex Differences in the Prevalence of Dental Caries. Pub. Health Rep., 46, 1: 26 (Jan. 1), 1932.

Fertility Rates—This study of the fertility rates of native white women in a rural area suggests evidence of unchanging fertility of native stock under a not greatly changing environment. Every health worker should see this bulletin if only for its exquisite format. He will return to his own publications to "read 'em and weep."

SYDENSTRICKER, E. A Study of the Fertility of Native White Women in a Rural Area of Western New York. Quart. Bull. (Millbank Memorial Fund), 10, 1: 17 (Jan.), 1932.

Cold Feet—The concluding sentence of the summary of an important contribution to our knowledge of physiologic response to air temperatures reads: "So far as the work here reported may be significant, however, it does not confirm the general belief that chilling of the feet is specially harmful."

WINSLOW, C.-E. A., and GREENBURG, L. Vasomotor Reactions to Localized Drafts. Am. J. Hyg., 15, 1: 1 (Jan.), 1932.

NEWS FROM THE FIELD

CANADIAN PUBLIC HEALTH MEETING TO BE IN TORONTO

THE Twenty-First Annual Meeting of The Canadian Public Health Association will be held in Toronto, May 25 to 27. The meeting will be held in conjunction with the Sixteenth Annual Meeting of the Ontario Health Officers Association.

FIGHTING INFANT MORTALITY IN BOMBAY

THE commissioner of public health for all India reports that in 1928 the infant mortality rate in Bombay was 290 per 1,000 live births, according to the London magazine *Mother and Child*. To combat this serious condition and the high maternal mortality the maternity department of the Bombay municipality is maintaining 5 free municipal maternity homes in different sections of the city. The department also maintains milk stations at which milk is distributed free or at a nominal price. Plans are also being made to establish dairies in the suburbs to assure the city a purer milk supply. Most of the present supply is produced within the city limits.

The Bombay Infant Welfare Society includes in its activities 2 maternity homes, a crèche for children of industrial workers, and 8 infant welfare centers. These 8 centers also distribute milk at a nominal price. The government of the Bombay Presidency has established in the city three hospitals which have prenatal and postnatal clinics.

A month's leave on full average pay, both before and after childbirth, is granted to women factory workers by the Bombay Maternity Benefit Act. A woman physician with the status of factory inspector looks after their interests. The draft of a bill which would compel the registration and supervision of midwives and provide for the appointment of a woman physician to administer the law as assistant to the health officer has been forwarded to the government by the Medical Women's Association of Bombay.—U. S. Children's Bureau, Washington, D. C.

WESTERN BRANCH CHANGES MEETING DATE

THE Third Annual Meeting of the Western Branch of the American Public Health Association is now definitely fixed for June 9–11, in Denver, Colo.

COST OF MEDICAL CARE

DR. BENJAMIN C. GRUENBERG, of New York, has accepted a temporary appointment to the staff of the Committee on the Costs of Medical Care.

Dr. Gruenberg has been granted a leave of absence by the Viking Press, New York, to take up his post with the committee. He has been educational editor of this publishing firm since 1929, prior to which time he was managing director of the American Association for Medical Progress.

The committee has completed practically all the preliminary research in its exhaustive 5-year study into the problem of " the delivery of adequate, scientific medical service to all the people, rich and poor, at a cost that can be reasonably met by them in their respective stations in life." Its final report will be published in the autumn of 1932.

NEW JERSEY HEALTH DEPARTMENT NEWS

NEW employees added to the staff of the New Jersey State Department of Health recently included: two district health officers, D. C. Bowen and Clyde R. Newell, of Freehold; three assistant sanitary engineers, Leigh W. Morrill, of Collingswood, Donald M. Ditmars, of Trenton, and Robert S. Shaw, of Lawrence Township; and two water shed inspectors, John H. Crabiel, of Pennington, and Lewis W. Klockner, Jr., of Bloomsbury.

FOOD RELIEF FOLDER

A FOLDER on emergency food relief and child health has been issued jointly by the U. S. Children's Bureau and the U. S. Bureau of Home Economics, for the use of social agencies throughout the United States whose work it is to provide the food necessary to safeguard the health and growth of the children of the families in their charge. The importance of the adequate diet is emphasized in this folder, and much attention is given to what is stated to be the "irreducible amounts" of foods below which it is not safe to let the diet fall, even for short periods of time, with lists of minimum weekly quantities.

NATIONAL NEGRO HEALTH WEEK

THE U. S. Public Health Service has issued a preliminary announcement on the Eighteenth Annual Observance of National Negro Health Week, April 3 to April 10, 1932.

PERSONALS

DR. HENRY S. WELLCOME, of London and Washington, was knighted by King George and had his name included in the New Year's Honours List. Dr. Wellcome is now serving as Honorary President of the American Pharmaceutical Association.

DR. JAY ARTHUR MEYERS, member A. P. H. A., has recently been promoted from associate professor to professor of preventive medicine at the University of Minnesota School of Medicine, Minneapolis.

DR. VINTON A. SELBY, member A. P. H. A., of Clarksburg, W. Va., resigned recently as Health Officer of Harrison County and was succeeded by Dr. Americus J. Kemper, of Lost Creek, W. Va.

DR. LINCOLN A. SUKEFORTH, member A. P. H. A., for 8 years Director of Public Health of Duluth, Minn., has retired.

DR. O. T. AVERY of the Rockefeller Institute, member A. P. H. A., has been selected to receive the first John Phillips Memorial Prize for 1932, which will be presented to him at the Sixteenth Annual Clinical Session of the American College of Physicians in San Francisco during the week of April 4, 1932.

CONFERENCES

March 6–9, International Congress and International Exhibit of Sanitary Technique and Urban Hygiene, Lyons, France.

April 4–8, American College of Physicians, San Francisco, Calif.

April 11–15, American Nurses Association, San Antonio, Tex.

April 11–15, National Organization for Public Health Nursing, San Antonio, Tex.

April 11–15, National League of Nursing Education, San Antonio, Tex.

April 19–23, 37th Annual Convention of the American Physical Education Association, Philadelphia, Pa.

May 9–10, American Association of Medical Milk Commissions, and the Certified Milk Producers' Association of America, New Orleans, La.

May 10–15, Annual Congress of The Royal Institute of Public Health, Belfast, Ireland.

May 15–21, National Conference of Social Work, Philadelphia, Pa.

May 25–27, The Canadian Public Health Association, 21st Annual Meeting, in association with Ontario Health Officers' Association, Toronto, Ont.

June 6–9, National Tuberculosis Association, Colorado Springs, Colo.

June 9–11, Third Annual Meeting, Western Branch, American Public Health Association, Denver, Colo.

July 21–29, 1932, 100th Anniversary Meeting, British Medical Association, London.

July, 1932, The Second International Conference of Social Work, Frankfurt.

August 15–18, International Congress for Light, Copenhagen.

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